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THE MAGAZINE FOR HOME WOODWORKERS

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OCTOBER 1987•ISSUE NO. 19
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THE FAMOUS AMANA VARNISH FINISH
Hand-rubbing makes the beautiful difference; how-to on page 70

TIMBER!
An Oregon craftsman tells how to fell a tree

PRODUCT BUYMANSHIP
WOOD gives you the lowdown on dovetail jigs and power carvers

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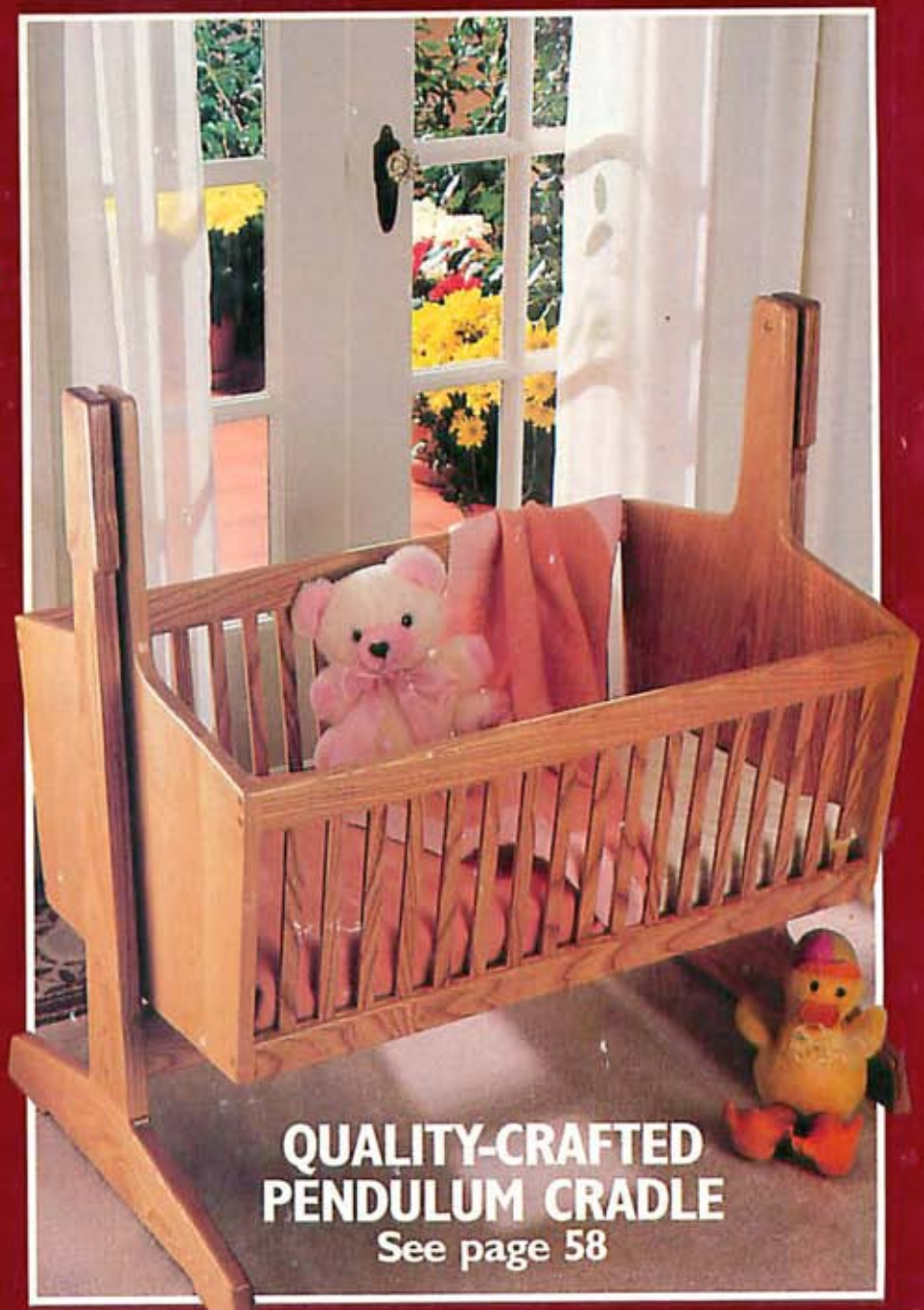
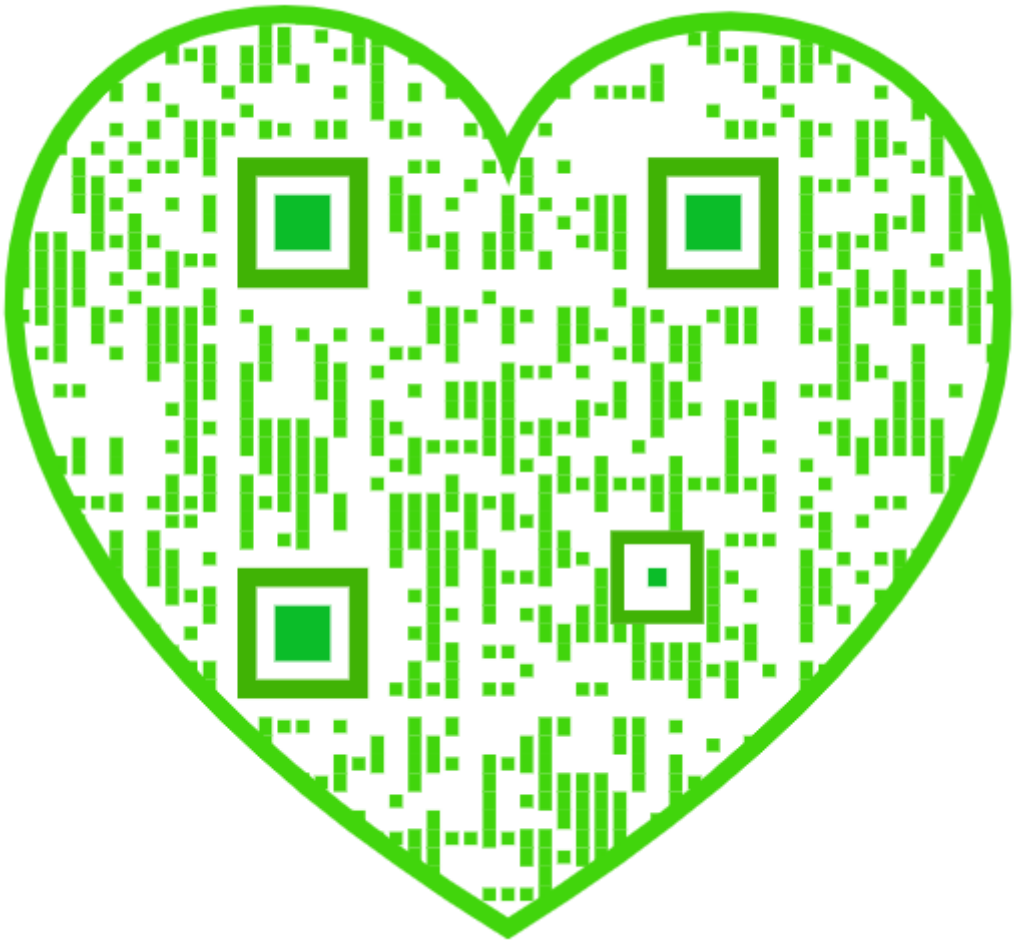


QUALITY-CRAFTED PENDULUM CRADLE
See page 58



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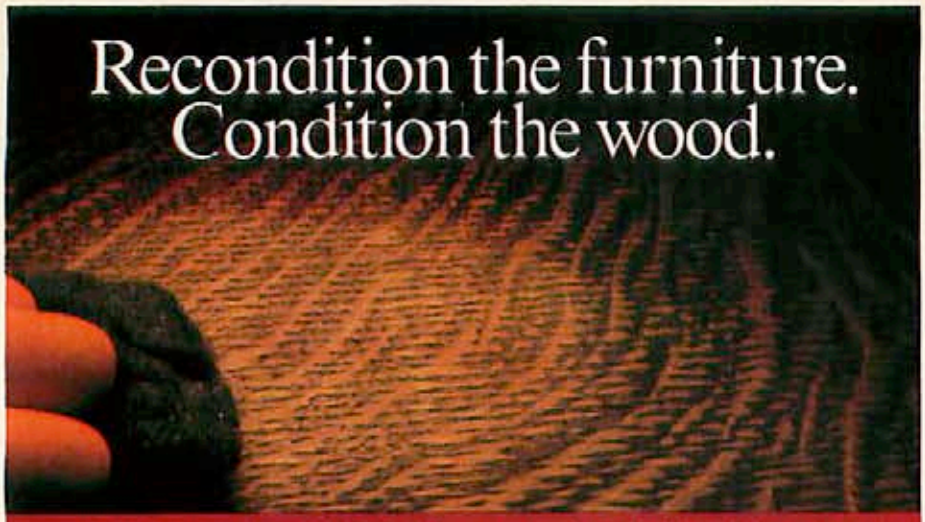

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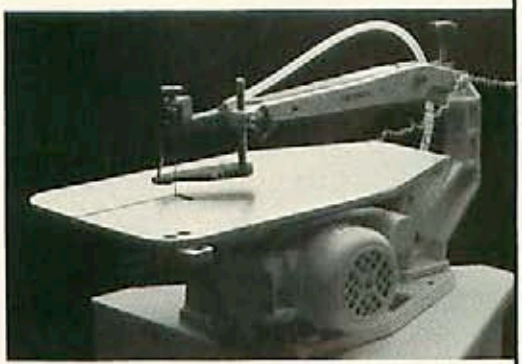

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WOOD

THE MAGAZINE FOR HOME WOODWORKERS

October 1987 • Vol. 4, No. 5 • Issue No. 19

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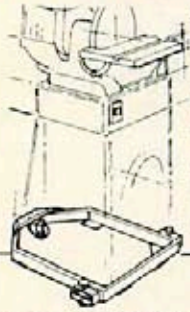

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WOOD®

This issue's cover wood grain: Knotty pine

OCTOBER 1987 **ISSUE NO. 19**

WOOD PROFILE

WESTERN RED CEDAR: THE DURABLE, DECAY-RESISTANT TREE OF LIFE 33

A great wood outdoors for long-lived fences, decks, and shingles; perfect indoors, too, for wall treatments, cabinets, and moldings.

TOOL BUYMANSHIP

DOVETAIL JIGS FOR YOUR ROUTER 34

Whether you make one or 100 dovetail joints, with a jig you can make every one perfect. We shop-tested eight jigs, and here's what we learned about them in the process.

CRAFTSMAN CLOSE-UP

PRESENTING THE GUARANTEED-FOR-A-LIFETIME, TEXAS-SIZE ROCKER 40

Down Texas way, things seem to come big naturally. Appropriately, Hugh and Jennie Vaughn work to build their dream business around another Texas-size specialty — a smooth-rockin' ash chair they perfected.

NOW YOU CAN BUILD IT

WOODWORKERS' TOOL CHEST 44

In days gone by, apprenticing craftsmen built a tool chest to show their mentors that they'd acquired the skills of the trade. Build this oak chest to show off your woodworking skills to others, and protect your tools in the bargain.

SHOP-TESTED TECHNIQUES

HOW TO MAKE PICTURE-PERFECT JOINTS WITH YOUR DOVETAIL JIG 48

Dovetail jigs look complicated and can be frustrating to use. But once you figure them out, it will be clear sailing to perfect joints. We show you how to set up a jig properly, step by step.

WE JUST HAD TO ASK: DO REAL WOODWORKERS BUILD FROM KITS? 50

It's unlikely we'll all agree whether or not kit builders deserve to boast "I built it myself." So, we tracked down five build-from-a-box devotees to find out why they like building from furniture kits, and if there maybe a kit project or two in your future, too.

TIMBER! 54

An Oregon craftsman harvests his own hardwood timber to get just the kind of wood he wants for his projects. Watch as he shows the safe way to fell a tree.

EDITORS' CHOICE PROJECT

QUALITY-CRAFTED PENDULUM CRADLE 58

What better way to welcome that special newborn than with this handsome heirloom cradle. Made of warm, beautiful ash, it's destined to be passed on from generation to generation.

NOTEWORTHY NOTEPAD HOLDER 63

Stay organized with this easy-to-make, handy notepad holder. We've designed it to hold two sizes of readily available sticky notepads.

ROTARY POWER CARVERS 64

They're versatile power tools, and are revolutionizing carving. Here's a rundown on what's available.

MADE IN AMANA 66

Visit a shop where fine furniture continues to be made the old-fashioned, handcrafted way.

THE TRADITIONAL AMANA FINISH 70

Learn how artisans apply the durable Amana varnish finish. Then, do it successfully yourself, by following the 12 easy steps.

BE A HARDWOOD SUPERSLEUTH 72

When you can't positively identify a hardwood, do like the pros — take a closer look.

QUICK AND EASY PROJECTS

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#W200100	2" $19.50/100
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TALKING BACK

We welcome comments, criticism, suggestions ...even an occasional compliment. The volume of mail we receive makes it impossible to answer every letter, but we promise to do our level best. Send your correspondence to: Letters Editor, Better Homes and Gardens® WOOD Magazine, Locust at 17th, Des Moines, IA 50336.

ROLL OUT THE BARREL

Your April dust collectors article (New Portable Dust Collectors, April 1987, pgs. 54-59) was excellent. I bought a Delta two-stage unit, and you are right when you say that lifting the top assembly is cumbersome. I've cured that by adding lifting rings to the unit, and suspending a light block and tackle from the ceiling. Now, when I need to empty the barrel, I just hoist it up and roll out the barrel.

Recently I bought some flexible transparent duct (R-2 clear) to make my own fixed-duct system. I think it's great! You can see the chips fly. And, if a blockage occurs, you can see right where it's at. The manufacturer, Flexaust (11 Chestnut St., Amesbury, MA 01913), sells a variety of products throughout the United States.

— H. Myles Jacob
Pittstown, N.J.

NO NEED FOR A BARREL HERE

Your article "Going All Out For Dust Control" (June 1987, pgs. 48-51) was very helpful to me in designing a vacuum system for my shop.

In the same issue, a "Shop Sense" story on page 87 showed how to make your own dust collector hoods with ready-made catcher strips. I bought several from Murphy-Rodgers, the source listed in the article, and recommend them to anyone wanting to build their own dust collecting hoods. I also purchased their metal slide gates — they call them "blast gates". The 4" units cost $15 each. The firm sells a variety of dust collection accessories including elbows, wyes, valves, and cleanout doors. A call (213/587-4118) will get you literature and prices.

— Donald R. Chapman, Woodland Hills, Calif.

Thanks, Don, for the report. We need to caution that nonmetallic duct must be grounded with a continuous wire running through the duct from the tool to the vacuum system to eliminate static buildup. Also, a short article showing the dust-bustin' attachments made for several power tools in the WOOD shop appeared on page 90 of the August, 1987 issue.

Continued on page 12

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TALKING BACK

Continued from page 8

DUST CONTROL WITH PVC PIPE COURTS TROUBLE

Does plastic (PVC) pipe really need to be electrically grounded when used as ductwork in a central dust collection system?

We've received several calls and letters questioning our statement that PVC drain pipe used for ducting in a central dust collection system must be grounded ("Dust Control", WOOD, June, 1987, pg. 48).

Yes it does! According to Delta International's technical people, "plastic drain pipe can build up large static electricity charges as dry, dusty air moves through it. A fire potential exists if the plastic pipe duct is used without grounding." The experts go on to recommend grounding with a continuous bare wire inside the pipe from each tool to a ground connection at the dust collector.

To keep large chips from lodging against the wire, stretch the wire tightly against the bottom inside wall of the pipe, lacing it in and out through small holes drilled in the pipe wall at each end and making an electrical connection across the joint on the outside of the duct. Seal the holes with silicone or similar sealant.

BE CAREFUL WHEN ROUTING BACKWARD

Your response to the "routing backward" question in "Ask *WOOD*," (December, 1986, p. 98) was accurate but left out, I think, an important safety point. As you implied in the answer, the bit can pull the wood rapidly toward the cutter, making a potentially dangerous situation.

I suggest woodworkers use several techniques to help keep their hands away from the unrouted portion of the board in case the router does bind, climb cut, and overfeed the wood. These are:

1 Keep your hands only on the routed portion of the wood. At the start, when this isn't possible, keep the hands at least 6" from the router bit. As soon as 6" of work has passed the cutter, transfer the hands to the routed portion and pull the rest of the work through the cutter.

2 Use hold-down devices, such as finger boards, whenever possible.

3 Sharpen the cutter before using to minimize overfeeding (and burning the wood).

— Michael L. O'Banion, Black & Decker, Inc.

Michael, thanks for the safety reminders — they especially apply when working with a table-mounted router. To your three, we'd also add a fourth — that you work on large stock and cut it to size after the shaping operation. And, as we cautioned in the original article, use the climb-cutting method sparingly.

Continued from page 12

LOCATING THE DRAGSTER'S SLICKS

I have made six rubber-band dragsters from your plans. They're great, except I can't find the rubber band sizes you specify anywhere.

— Ed Franzen, Minneapolis, Minn.

Alliance Rubber Company distributes the rubber bands used on the dragster. You'll find them at stationery stores, supermarkets, and major chain stores such as Target, K Mart, Toys-R-Us, and Wal-Mart. The firm has 10,000 accounts throughout the United States so they should be widely available.

If, after checking these sources locally, you still are unable to find the right rubber bands, call Alliance at 1-800-626-5940. Ask for the names of stores selling their products in your area. The firm requests, however, that you check local sources before calling.

As an alternative you can substitute several narrower rubber bands in place of a wide one.

SAFER PLACE FOR TURNING TOOLS

I am horrified because of the photo on the April cover showing the lathe tools hung behind the machine. For safety reasons I suggest they be located at either end of the lathe. Then the operator would not have to lean over the lathe to reach a tool. Any loose clothing or an apron could easily get caught and wrapped around the spinning stock.

— Jim Moore, Downey, Calif.

TUNING UP THE RUBBER-BAND DRAGSTER

The race car project (Rubber-band Dragster, April 1987, pg. 84) has been the biggest hit of all the projects that I have made from WOOD. My 19-month-old son loves it. But I have one suggestion. Readers making the dragster for younger children may want to put a large bead of epoxy glue over the head of the nail so that little ones won't get scratched by it.

— Eric Morehouse, Ft. Huachuca, Ariz.

MORE TIPS FOR MAKING PATTERNS

I have a suggestion for transferring patterns. Make your own transfer paper without using carbon paper. Take a piece of tracing paper and rub one side of it with a colored piece of chalk, getting as uniform chalk coating as you can. Then saturate one or two cotton balls with a solvent such as rubber cement thinner and smear the chalk all around. When the thinner evaporates, you have reusable inkless transfer paper. Use it as you would carbon paper. If you make a mistake when using it, just wipe away the error with a slightly damp cloth.

— Mary Bowser, Milwaukee, Wis.

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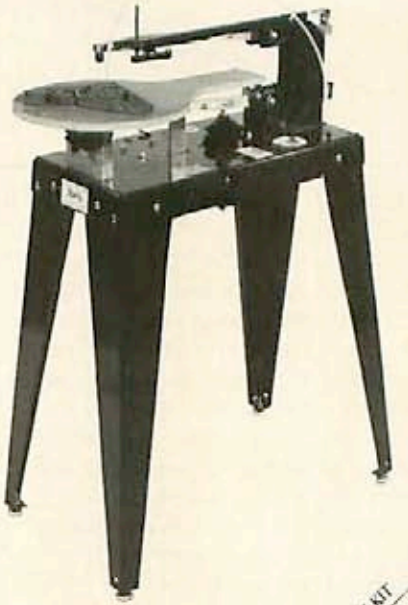

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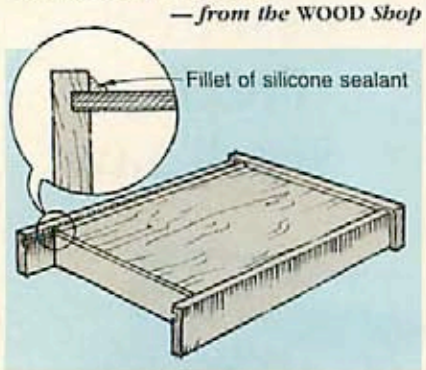
NO MORE RATTLES

Drawer bottoms must remain free-floating (not glued to the drawer frame) to allow for expansion and contraction due to changes in humidity. But often, the drawer bottom will develop a rattle as the other parts loosen up.

TIP: Apply a fillet of silicone sealer along the dadoed joints where the bottom fits into the frame. The flexible silicone silences the rattle, yet allows the drawer to expand and contract as it needs to.

— from the WOOD *Shop*



DRAT! ANOTHER BROKEN SCREW

Many a foul word has been uttered after accidentally twisting off the head of a wood screw while trying to drive it into dense wood. And more such words usually follow while trying to undo the mess.

TIP: Here's a 4-step process for removing the broken screw and repairing the damage:

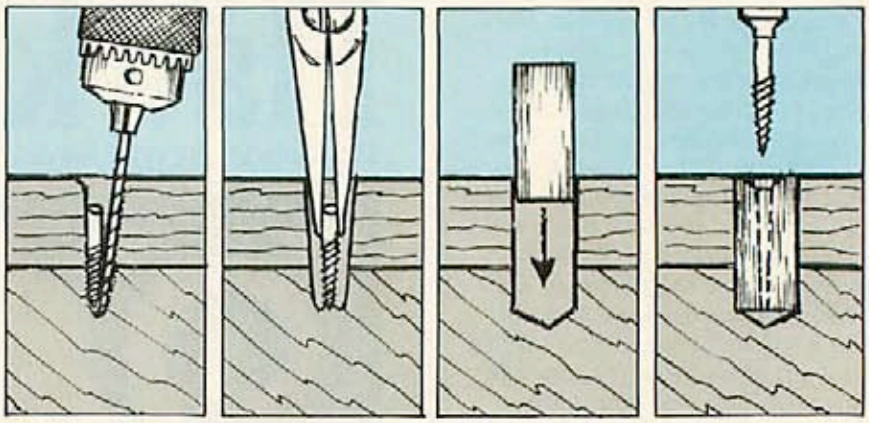
1 Equip your drill with a 5/32" twist bit, then drill holes all the way around the screw, slightly deeper than its length.

2 Back out the screw with a pair of needle-nose pliers.

3 Drill out the damaged area, using a 5/16" or 3/8" bit, and glue in a suitable length of hardwood dowel.

4 Using the correct-size screw pilot bit, drill a pilot hole in the dowel for the new screw.

— Bruce Vandermark, Syracuse, Ind.



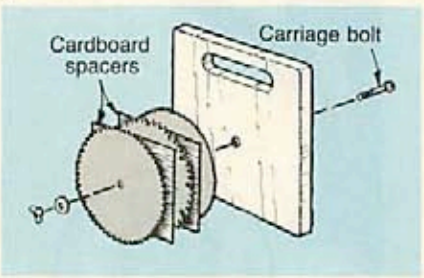
TWO SAFE SAW-BLADE HOLDERS

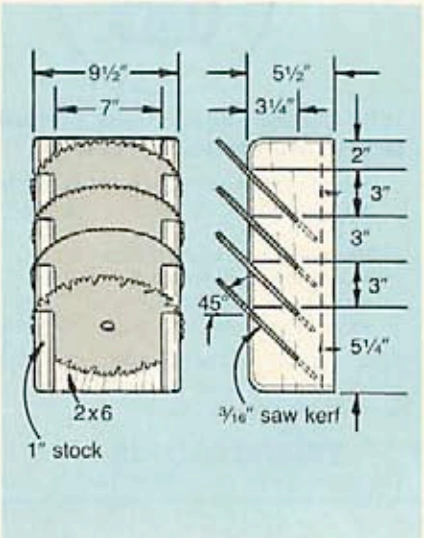
Circular saw blades — sharp or dull — need tender, loving care. These two blade holders will protect the blades — and your hands.

TIP: Make a blade holder like the one shown *top right* to store your dull blades and to cart them to the sharpening shop. Use cardboard spacers, as shown, to separate and protect the teeth on the blades.

When you get the sharp blades back from the shop, store them in a wall-mounted rack like the one shown *lower right*.

— George Gildea, Fort Thomas, Ky.





Do you have any good tips you'd like to share with our readers? We'll pay you $25 for each submission we publish. No shop tips can be returned. Mail your tips to:

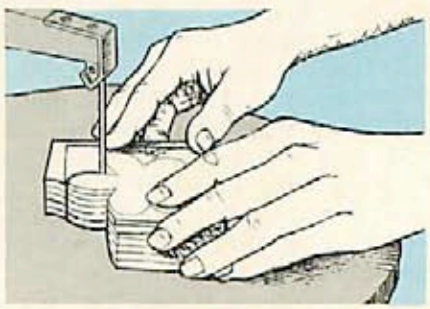
Shop Tips
Better Homes and Gardens®
***WOOD* Magazine**
Locust at 17th
Des Moines, IA 50336

SMOOTHER SCROLLING

If you've ever used a scroll saw to cut intricate pieces from stock 1/8" or thinner, you've probably noticed that it's hard to negotiate sharp curves and still stay on the line. It's also tough to get a clean cut.

TIP: We've found it's much easier to make tight cuts in stock at least 1/2" thick because the blade cuts less aggressively, giving you better control. Also, it's easier to hold and control the stock with your fingers. So, when working thin material, tape several pieces together and stack-cut them. Need only one? Tape the thin stock to a scrap of 1/2" knot-free softwood.

— From the WOOD *Shop.*



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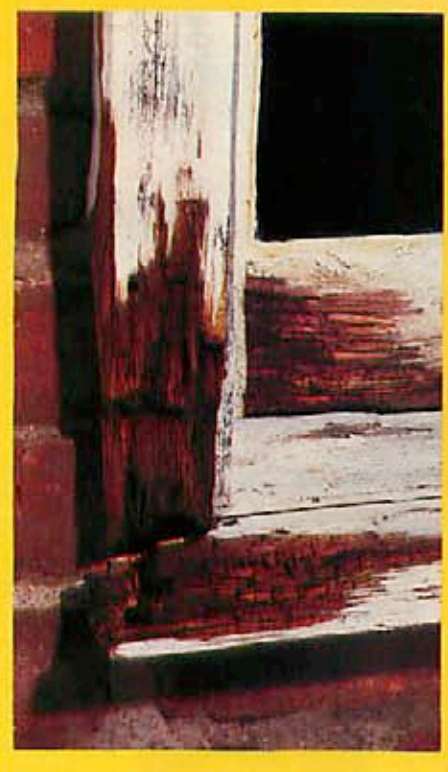

$300 to replace. $10 to repair.

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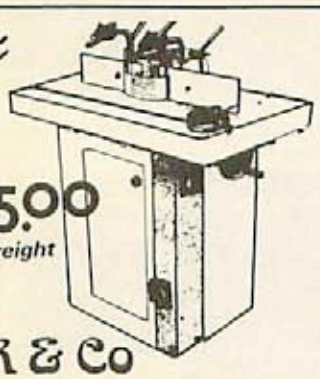

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TIPS FROM YOUR SHOP (AND OURS)

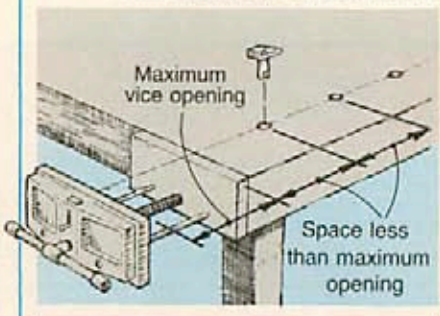
Continued from page 14

A DOGGONE GOOD IDEA

Have you ever wished for a fancy cabinetmaker's bench, complete with steel bench dogs, but somehow couldn't justify the cost? Sure, you can fit steel dogs to your bench. But it's a hassle to cut the square mortises in the benchtop to accommodate them.

TIP: If your bench has a vise with an adjustable stop, try this: Fit it with plastic dogs made for the Black & Decker Workmate. They're less costly than steel dogs (about $2.50 each from Black & Decker dealers), and have *round* shanks. Drill a series of ¾" holes in line with the center of your vise. Space them a bit closer than the vice's widest opening.

— Alan Shearer, Great Falls, Va.

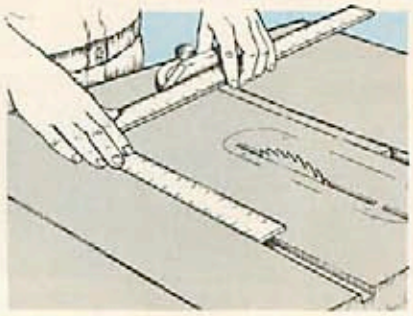


MITER-GAUGE TUNEUP

Here's the fastest way we've found to square up a table-saw miter gauge.

TIP: First, loosen the setscrew on the miter gauge. Then, butt one leg of your framing square against outer edge of the right-hand guide slot on the saw table. Square the gauge to the other leg of the square, then tighten the setscrew. This trick works only if the saw blade is parallel to the guide slot.

— From the **WOOD** *Shop.*



Continued on page 20

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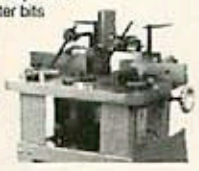

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3 Wing, 5 Profiles, 3MM Thick Carbide
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• 4 5/8" OD with 3/4" Bore (1/2" Bushing)
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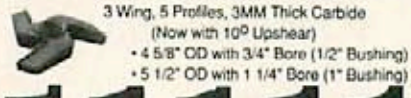

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TIPS FROM YOUR SHOP (AND OURS)

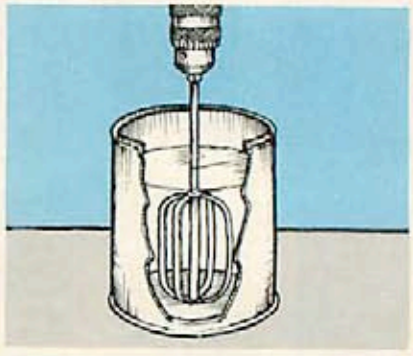
Continued from page 18

HOW TO BEAT THE MIXING GAME

Hand-mixing paints, stains, and powdered wood fillers, can be tedious. And often, the stirring attachments made for electric drills provide either too much or too little agitation for the amount of material you're mixing.

TIP: For your next mixing job, chuck a beater from an electric kitchen mixer into a variable-speed drill. Start mixing slowly, then increase the speed until you get a feel for how the beater works. To clean the beater, spin it in a can of water or thinner.

— Greg Howard, Bremerton, Wash.

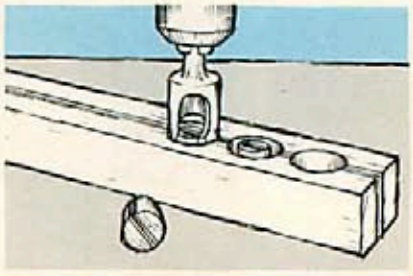


PLUGS WITH PIZZAZZ

Normally, you want flush dowel plugs to be unobtrusive and not noticed. But if that's not possible, why not make them real eye-catchers?

TIP: To make attention-grabbing plugs, laminate several layers of contrasting veneers between the halves of a hardwood block, as shown *below*. After the glue dries, use a plug cutter and cut plugs with real zip. Or, use just one contrasting color to simulate traditional wedged plugs.

— Timothy Breidenbach, Grand Forks, N.Dak.



TIMESAVING 4-IN-1 TAPE MEASURE

Why use a tape measure and a square for measuring and marking long boards for cutoff when you can use just one tool? The Tape-Square by Evans Rule does both operations in a hurry; you can also use it to mark 45° angles, and as a compass for drawing *big* circles. To make square cutoffs with the Tape Square, first measure and mark the stock, then flip the tape body on its side and mark a square cutoff line, as shown in the photo at *left*.

With the Tape-Square, you can draw a continuous 90° mark across stock up to 3¾" wide. And by aligning marks from opposite sides of the stock, you can mark boards up to 7½" wide. Using the same "opposite side" method, you can mark 45° angles in boards up to 7" wide.

To draw a circle, first drive a nail through the hole in the rule and use it as a pivot point. Extend the steel tape to the desired radius. Then, hold your pencil against the hooked end of the tape to draw the circle or arc.

Tape-Square by Evans Rule. Available at selected hardware stores and home-improvement centers. We ordered ours for $14.95 postpaid from Woodcraft Supply Corp., 41 Atlantic Ave., Box 4000, Woburn, MA 01888.

NOW HERE'S A SHAPELY SCRAPER

Most paint and varnish scrapers have a straight blade, making them worthless for scraping finishes from contoured surfaces and hard-to-reach crannies. Enter, the Shape Skrape! With six interchangeable blades, this tool takes much of the hassle out of scraping the finish off intricate surfaces. We used it to tackle the antique chair pictured *above*. So, before you attack your next refinishing project, add this weapon to your arsenal.

Shape Skrape, $7.75 plus $1.25 shipping and handling from The Connecticut Valley Mfg. Co., P.O. Box 3200, New Britain, CN 06050.

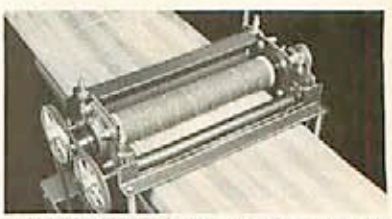
Continued on page 24

Like Having A Lumberyard Right In Your Shop!

NOW! PLANE, MOLD & SAND *with the Precision Control of* Infinitely Variable Power-Feed!

Just a twist of the dial gives you from 70 to over 1000 cuts per inch . . . you can sail through even the toughest oak at higher speeds, or slow down to surface stock that is virtually impossible on any other machine. Slower speeds turn out glass smooth molding . . . no sanding needed!

Woodmaster's Quick-Change Molding Head lets you create custom moldings from any stock. Choose from over 250 standard trim and picture frame patterns . . . or design your own!



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Now you can make boards from your own logs (up to 23" in diameter). To *your* dimensions. Right where your tree is felled.

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You can mill hundreds of board-feet of dimensioned wood in a day's time.

At that rate you can pay for your Lumber Company pretty quickly.

To find out more about The Lumber Company, or to get a video cassette demonstration, call toll-free: Delta International Machinery Corp., 800/438-2486. (In PA, 800/438-2487.)

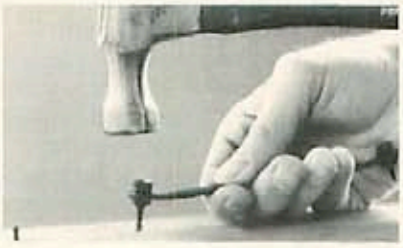
Converts to vertical band saw for ripping. (stand optional)

DELTA
Building On Tradition

PRODUCTS THAT PERFORM

Continued from page 23

A NEW ANGLE ON SETTING NAILS



Say good-bye to smashed fingers and aching wrists with this double-end offset nail set. The offset design keeps your fingers out of the way of the hammerhead, and gives you better control than with a conventional nail set. The short shank reduces the chance of an off-center hammer strike, and the flat handle provides a natural grip to reduce hand and wrist strain. We also like the double-ended feature (1/32" and 3/32" points). It definitely fits our "better mousetrap" category.

Offset nail set. We ordered ours for $7.50 plus $2.50 postage and handling from Garrett Wade, 161 Avenue of the Americas, New York, NY 10013 (cat. no. 36K01.01).

FAST-SETTING EPOXY AT A PENNY-PINCHING PRICE

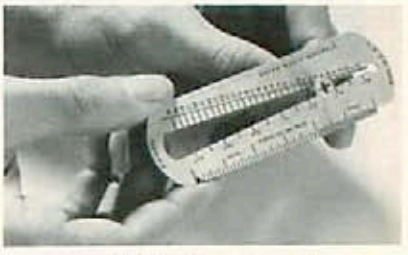
Here at *WOOD*, we like to build things right. But often we have to build them in a hurry, too. So, we go through a lot of fast-setting epoxy for quick glue jobs. And often, it's the best adhesive to use for hard-to-clamp glue joints. You'll now find several "5-minute" epoxies on the market. But we haven't been able to beat the price of this one. Most fast-setting epoxies come in double-barrel syringe-type dispensers. At $2.50-$3 apiece, the two-solution dispensers make 1 ounce of epoxy. This product costs $8 for an 8-oz. kit (4 oz. each resin and hardener). The handy plastic squeeze bottles make it easy to dispense equal proportions of resin and hardener for mixing. (You can do this by eye, because the proportions don't have to be precise for the epoxy to work.) We found the bonding strength equal to other epoxies of this type on the market.

Quick-Cure Epoxy, 8-oz. kit $8, pint $15, quart kit $28 postpaid from System Three Resins, P.O. Box 80723, Seattle, WA 98108.

POCKET-SIZE GAUGE MEASURES SCREWS AND DRILL BITS

Smaller than most drill gauges, this handy measuring tool takes the guesswork out of identifying unmarked drills, screws, and wire. One side gives standard wood screw sizes from #0 to #30, drill bit sizes from 1/16" to 7/16" and lengths up to 3" to the nearest 1/32". The other side reads American standard wire gauges (AWG) from 0000 to 15 and English standard wire gauges (BWD) from 000 to 17.

Made of heavy-gauge, hardened, ground carbon steel, the gauge has etched markings. We like its small size (1¾"x4") and found it quick to use. Keep one close to that coffee can full of miscellaneous screws or drawer full of unmarked drill bits — and another in your pocket while working in the shop.



Wire/Screw Gauge no. 26 by General Hardware. We ordered ours for $5.95 plus $2.50 postage and handling from Micro-Mark, Box 5112, Clinton, NJ 08809.

Continued on page 29

PRODUCTS THAT PERFORM

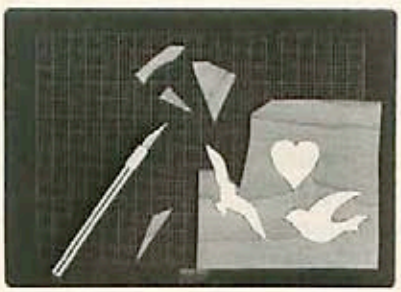
Continued from page 24

CLEARLY CLEARER CLEAR SILICONE SEALANT

Recently, we were working on a small project that required setting glass in a wood frame, using a clear, flexible silicone-type sealant. We wanted the glaze to dry crystal clear, which so-called clear silicones don't. Household Goop does. Like silicone, it bonds a wide variety of dissimilar materials, and dries to a rubberlike consistency. But we found that it has far greater bonding strength.

Household Goop, available at hardware stores and home-improvement centers. We paid $3.50 for a 3.7-fl.-oz. tube.

THIS CUTTING BASE LASTS — NO MATTER HOW YOU SLICE IT



Amazing! Knife cuts all but disappear on this 5-ply PVC cutting base, leaving a perfectly smooth surface. It's perfect for cutting out patterns and veneers for projects. We found the green, nonglare surface firmly supports delicate veneers, yet easy on knife blades.

Charvoz Cutting Base (8½" x 11", cat. no. 36113), $12.95 plus $2.50 shipping. Micro-Mark, Box 5112, Clinton, NJ 08809.

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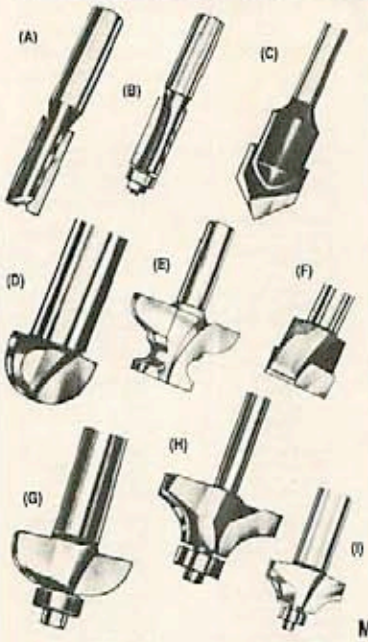
CARBIDE TIPPED ROUTER BITS



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AJH4701008		1/2"	1"	1/4"	6.90
AJH4701011		3/4"	3/4"	1/4"	10.65
AJH4701022		1/2"	1 1/2"	1/2"	12.25
AJH4701027		1"	1 1/4"	1/2"	11.45
		(B) FLUSH TRIMING BITS			
AJH4701029		3/8"	1"	1/4"	8.20
AJH4701032		1/2"	1 1/4"	1/4"	8.20
		(C) 90° V-GROOVE BITS			
AJH4701051		3/8"	1/2"	1/4"	11.45
AJH4701052		1/2"	1/2"	1/4"	13.95
AJH4701053		5/8"	5/8"	1/4"	16.40
		(D) CORE BOX BITS			
AJH4701057		1/4"	1/4"	1/4"	9.00
AJH4701058		3/8"	3/8"	1/4"	12.25
AJH4701059		1/2"	11/32"	1/4"	13.95
AJH4701061		3/4"	5/8"	1/2"	19.70
AJH4701063		1"	3/4"	1/2"	24.65
		(E) CLASSICAL PATTERN BITS			
AJH4701165		1 1/2"	1"	1/2"	34.00
AJH4701167		1"	3/4"	1/2"	28.80
		(F) BOTTOM CLEANING BITS			
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AJH4701170		3/4"	3/4"	1/2"	18.50
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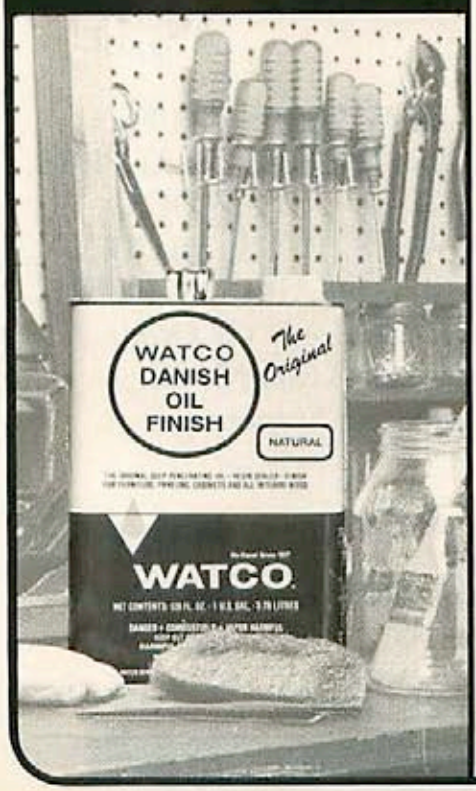

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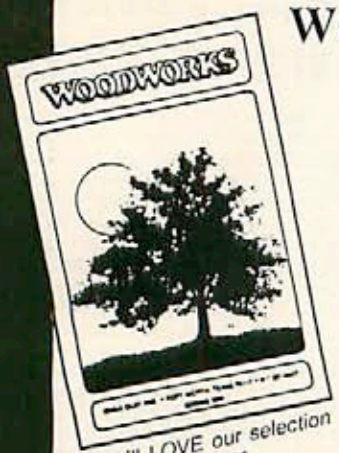

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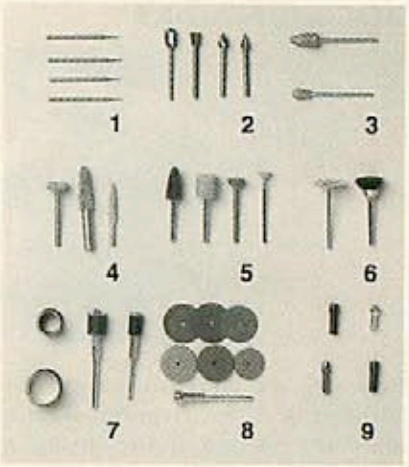

Here are a few of the many bits and accessories available for rotary power carvers. We review the tools themselves on page 64.

1. Detail bits
Use these bits for extremely fine detail work. Available in high-speed steel and carbide.

2. Fluted burs
Fast cutting bits used for quick stock removal, general carving, and shaping. Available in high-speed steel and carbide.

3. Ruby abrasive bits
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4. Carbide "Kutzall" rasps
New, these rasps cut extremely fast — with or against the grain.

5. Texturing stones
Available in various shapes, sizes and abrasive materials. Use them for creating special textures.

6. Nylon and steel bristle brushes
Used for burnishing wood, polishing hard-to-reach surfaces.

7. Sanding Drums
Use to sand inside contours. Available in various diameters, grits.

8. Abrasive discs and wheels
Sandpaper or abrasive-stone discs, used for smoothing and texturing.

9. Collets
They come in different sizes. The wider range of collets a tool takes, the more accessories you can use.

Photograph: Jim Kascoutas

THE MAGAZINE FOR HOME WOODWORKERS
OCTOBER WOOD 1987

WESTERN RED CEDAR

The durable, decay-resistant tree of life

Botanist Louis Nee discovered western red cedar on Vancouver Island in the Pacific Northwest about 1794. Long before he ventured there, the region's Indians were making planked lodges of the lightweight, yet highly durable, wood. Outside, next to the lodges, stood towering, carved totems depicting family histories. Also made of western red cedar, many of the poles still stand near Ketchikan, in southeastern Alaska.

This versatile tree, once called giant *arborvitae,* the "tree of life," was exactly that to the coastal tribes. It provided them with long, tough strands of bark that they wove into baskets, braided for rope, and cast as fishing lines. For travel, they made 50′-long canoes of hollowed logs.

The first daring pioneers in that wild land soon learned to work western red cedar, too. Since then, the wood has been extensively used for outdoor construction, shingle and shake roofing, siding, boats, and just about any project demanding decay-resistance.

Wood identification

A tree of the cool, damp coastland, western red cedar (*Thuja plicata*) grows in moist soil from southern Alaska to northern California. The western slopes of the Rocky Mountains in Idaho, Montana, and British Columbia form the eastern limit of its range. On the rain-washed coast, the tree can reach heights of 190′ and diameters of 10′ or more.

Western red cedar heartwood

Western red cedar heartwood with sapwood

Western red cedar may have as many names as branches. Some people call it canoe cedar, or shingle wood, while others refer to the tree as Lawson cypress and Pacific red cedar. Western red cedar's latin name, though, loosely translates to "sweet-smelling wood with plaited leaves." And the characteristic smell as well as the leaves help you identify it. The flat, lacy-looking sprigs of small, braided leaves (not needles!) give off a spicy aroma, as does the wood. The thin reddish-brown bark resembles cinnamon in color, and comes off in strings.

Medium- to coarse-grained, western red cedar completely lacks pitch or resin. The small amount of sapwood you'll find is almost pure white. The heartwood varies from a dark, reddish brown to a pale yellow. With age, the color dulls to a silver-gray.

Working properties

Lightweight at about 28 lbs. per cubic foot, western red cedar has low shock resistance. It's also only moderately limber, but you can count on red cedar's stability.

Work this wood with both hand and power tools. Use caution, though, when planing or sanding so you won't catch and tear the grain. While western red cedar does not hold nails well, it glues easily.

For exterior use, western red cedar takes and holds paint and stain with persistence. Inside, finish it with lacquer, varnish, or clear wax.

Uses in woodworking

You can rely on western red cedar anywhere you want the warm color of wood, and durability. Outdoors, it's perfect for carefree, long-lived decks, fences, and furniture; indoors, for wall treatments, cabinets, and moldings and millwork.

Because it's soft, it makes a good carving wood. Combat the brittleness with a sharp blade.

Cost and availability

Clear heart western red cedar, the best grade, costs about $2 per board foot. A-grade, which can include some knots as well as hints of white sapwood, sells for less.

You can find it in standard softwood dimensions, both rough-cut or surfaced, at most lumberyards from the Midwest to the Pacific. Cost of shipping limits its availability in the East.

Illustrations: Steve Schindler

DOVETAIL JIGS FOR YOUR ROUTER

WOOD PUTS 8 TO THE TEST

The traditional method of making dovetails — by hand — requires precise layout and laborious, exacting cuts for a perfect fit. But with a dovetail jig, you can master the technique and knock out dovetailed drawers or boxes by the dozens — and not spend the whole weekend doing it.

We tested eight jigs designed for the home woodworking shop. After running each jig through its paces, we can say without reservation: You don't have to be a pro to crank out consistently accurate joints with these fixtures.

HOW DO THEY WORK? Easier than you might think!

At first glance, these jigs may look complex and intimidating. But don't let them scare you. Actually, you'll find the idea behind them quite simple and the jigs easy to use.

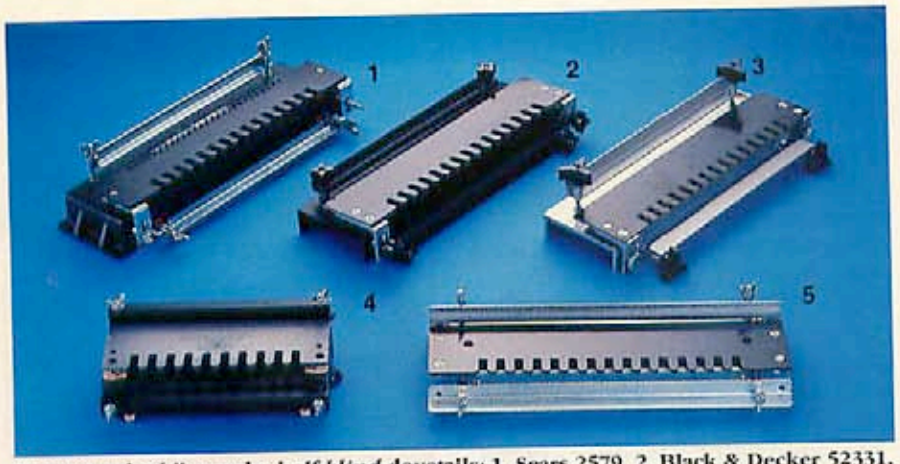
As shown in the sketch at *right*, each jig has these basic components:

- A metal or plastic base, which you fasten to your workbench.
- A preset finger template to guide your router through the stock.
- Adjustable guide stops or pins to align the board ends with the template fingers and each other.
- Two bar clamps to hold the boards in position while you rout the pins and tails.

And there you have it — your basic jig. The rest of the hardware — nuts, bolts, screws, brackets, springs, and knobs — hold the whole thing together, and enable you to adjust the template and operate the bar clamps.

When we tried out the jigs, we found nothing very mysterious about the way they work. However, we'll admit that each of them takes time and patience to set up and adjust properly. But once we got the jigs fine-tuned, the hard part was done. Then it was just a matter of clamping the pieces in the jig and routing the joints — one after the other.

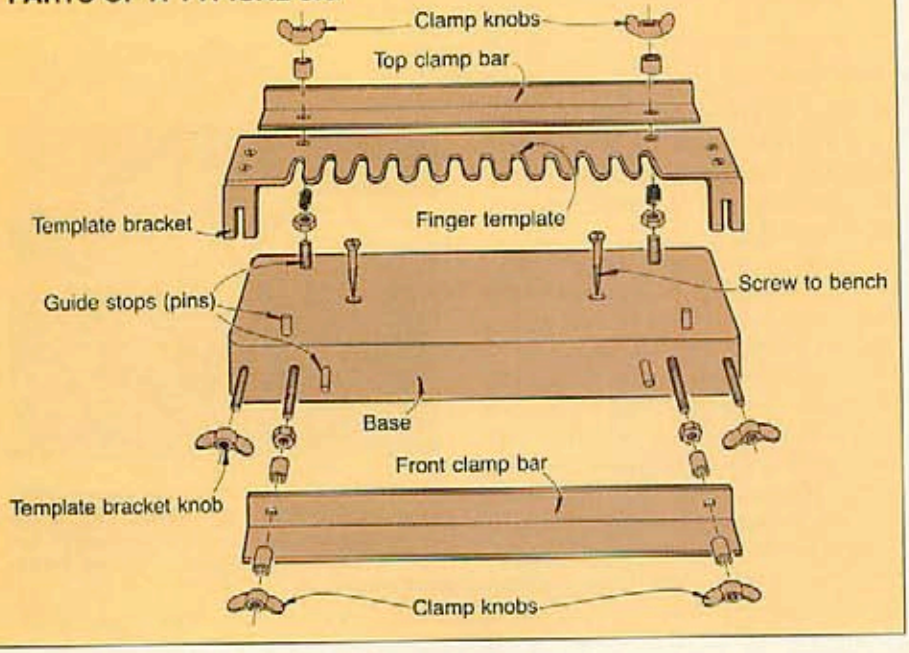
On pages 48-49 we show you the specific steps in setting up and using a typical jig. We used the Sears model 2579 for our demonstration, but you can apply the basic procedures to any of the jigs shown on the facing page.



These standard jigs make *half-blind* dovetails: 1. Sears 2579, 2. Black & Decker 52331, 3. Bosch 82913, 4. Vermont American 23460, 5. Porter-Cable 5008. You'll find them listed under "router accessories" in the manufacturer's catalogs.

Joints you can make with the basic jigs: *Left to right:* ¼" flush dovetail, ½" flush dovetail, ½" flush dovetail with spaced pins, ½" rabbeted dovetail, ½" box joints (Sears only), and ¼" box joint (Sears only).

PARTS OF A TYPICAL JIG



STANDARD JIGS:
Low cost, limited versatility

Five of the jigs we tried — Black & Decker, Bosch, Porter-Cable, Sears, and Vermont American — fit into this category. Similar in design and size, these jigs all work just about the same way. And all cost under $100.

Note: *These five jigs will make* half-blind *dovetailed joints only. The photo at* left *shows the various sizes and combinations of joints you can make with them. Cabinetmakers often use half-blind dovetails on drawer fronts because they don't want the joint to show on the drawer face. If you want a dovetail joint with the pins and the tails showing on both pieces (called a* through dovetail*), you'll have to buy one of the more expensive jigs — Leigh, Omnijig, or Keller (see pages 38-39).*

These five standard jigs have templates for making evenly spaced ¼" and ½" dovetails. The Sears and Vermont American have double-sided templates with ¼" fingers on one side and ½" fingers on the other. The rest of the jigs come with a ½" template but offer an optional ¼" template. Sears also sells a template for routing ¼" and ½" box joints (numbers 5 and 6 in the photo at *left*).

The Black & Decker, Bosch, Sears and Porter-Cable jigs will dovetail stock up to 12" wide. The Vermont American has a maximum capacity of 8" (Sears has a similar model). Bosch offers 12"- and 16"-wide versions.

These jigs use *fixed-space templates.* This means the templates don't allow you to vary the tail and pin spacing, except by skipping slots in the template as you rout the joint. By comparison, the Omnijig and Leigh jig, pages 38-39, use templates with adjustable guide forks, so you can space the pins and tails where you want them.

When we tried these five jigs, we found features we liked — and didn't like — on all of them. We report our findings on the following two pages.

Continued

DOVETAIL JIGS

BLACK & DECKER: A good, all-around choice

We like the way this one's built, and think you will, too. The sturdy cast-aluminum base and template brackets minimize any flexing that could affect cutting accuracy. The U-channel construction of the ⅛" steel clamp bars provide more clamping power than the jigs with L-shaped bars, which we found tended to bend when we really tightened them.

We also like the plastic knobs on this jig and the Bosch — they're easier and more comfortable to turn than the wing nuts used on the other jigs.

We didn't care much for the template adjustments. You have to loosen and tighten two locknuts on the template-bracket assembly to move the template forward or backward for fine adjustments. (Sears and Bosch also use this method.) We found adjusting the Porter-Cable and Vermont American jigs easier and faster.

The rigid U-channel clamp bars keeps a good grip on the stock.

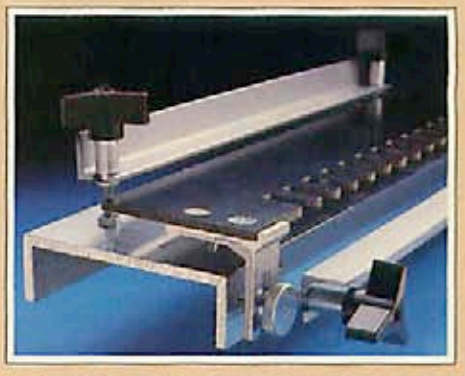
BOSCH: Top of the line in durability

We found the Bosch to be the sturdiest of all the standard jigs tested. The heavy, ¼" extruded-aluminum base provides solid support for the clamp bars, guide stops, and template-bracket assembly. While using this jig, we noticed almost no play or flex in any of these parts. We liked the tiny grooves milled into the base, which help keep the stock from slipping while being routed. The large plastic clamp knobs are easy on the fingers.

The heavy aluminum clamp bars have a slightly rough surface that provides a good grip on the stock. The bars did bend slightly when we over-tightened them, but they sprang back to their original shape when loosened.

As impressed as we were with the quality of this jig, we were equally unimpressed with the owner's manual that came with it. Instructions were brief, sketchy, and poorly illustrated.

Also, the owner's manual specifies bits and guide bushings by catalog number, rather than size. When we checked their catalog, we found that Bosch specifies slightly larger bits (9/32 and 9/16). But we found the jig works with the ¼" and ½" bits used with the others.



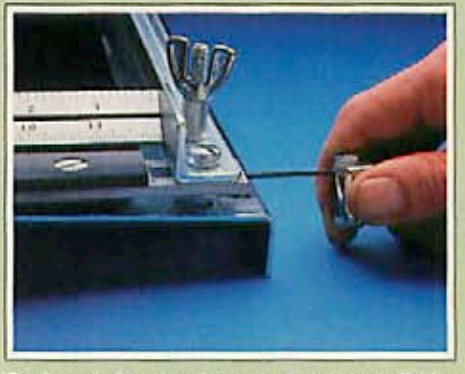
Heavy-duty aluminum construction makes the Bosch an exceptionally durable jig. We like the large, easy-to-use plastic clamp knobs and knurled aluminum template-bracket knobs.

PORTER-CABLE: Easy to set up and use

We like the template adjustment on the Porter-Cable, mainly because you can actually measure the template position on the jig. This makes it much easier to tell if you have the template parallel to the jig, and to make subsequent adjustments. The template bracket bolts to the top clamp bar at the back of the jig. You fine-tune the template by turning a set screw with an Allen wrench, as shown at *right*.

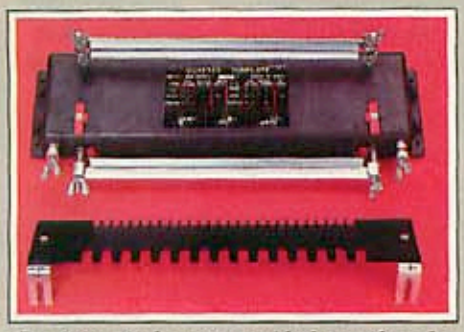
Porter-Cable uses wing nuts to tighten the clamp bars, as do the Sears and Vermont American. And, as mentioned before, these nuts can make for sore fingers if you're doing lots of joints. We feel that this jig isn't quite as sturdy as the Black & Decker or Bosch jigs. But it performed well, with little play in the hardware.

While using this jig, we had trouble clamping boards narrower than 6 inches with the top clamp bar. We found the bar didn't have enough clamping surface, causing the board to slip out of alignment while being routed. We had the same problem with the Sears, and were able to correct it in both cases by attaching a strip of 150-grit sandpaper to the bar with double-face tape, which gave it more grip.



We found the template on the Porter-Cable easier to fine tune than most. You adjust the template's position by turning a set screw located at each end of the base with an allen wrench.

SEARS: Some nice extra features add versatility



The Sears jig has a two-sided template for ¼" and ½" dovetails.

As mentioned earlier, the two Sears jigs (and the similar Vermont American) come with a double-sided template for making ¼" and ½" joints. You simply reverse the direction of the template brackets to switch sizes.

We like the label on the jig body, which lists guide-stop settings, template-bracket positions, and router-bit depth for the various joints. We found it saves time thumbing through the manual when you want to change setups. Sears also offers an optional double-sided template with deeper fingers for making ¼" and ½" *box* joints.

We didn't particularly like Sears' plastic base. It allowed some flexing in the support brackets for the template and clamp bars. This didn't seem to affect the accuracy of the joints we made on the jig, though. Just don't bear down on the router while routing, and the jig should work fine.

VERMONT AMERICAN: Small but sturdy

A racheted tab adjusts the template in 1/64" increments for easy setup.

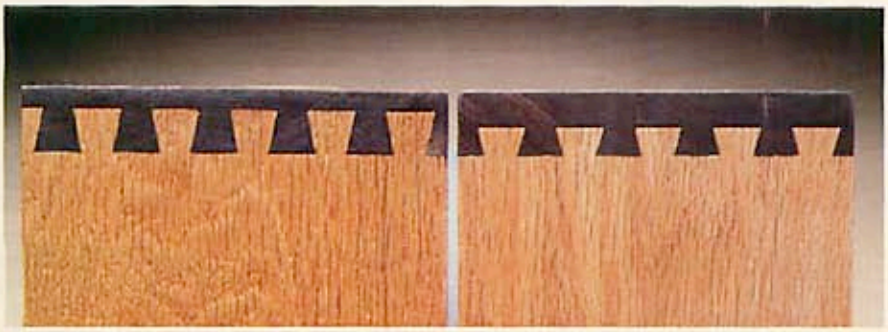
The 8" capacity may be a drawback, but the Vermont American does just as good a job as the bigger jigs. It also has several features we like. The sturdy U-channel clamp bars provide a solid grip on the stock — we couldn't bend the bars no matter how hard we tightened them. Like the Sears, this jig has a double-sided template for ¼" and ½" joints.

We also like the easy-to-operate template adjustment. You'll notice in the photo at *left* that the template has no bracket — it fits directly over the bolts that hold the top clamp bar. You fine-tune the template by turning a plastic tab located at each end, as shown in the photo. Each "click" of the racheted tab moves the template forward or backward by 1/64".

BITS, BUSHINGS, AND JIGS: It's OK to mix 'n' match

If you buy a jig from Black & Decker, Bosch, Porter-Cable, or Sears, you don't necessarily have to buy the dovetail bits — or router and template guide bushings — from the same company. For example, you can rout ¼" or ½" dovetails on the Black & Decker jig, using a Bosch router equipped with a Sears or Porter-Cable bit. So, if you already have a router and the right-size bits and bushings, you can use them on any of these jigs.

Attached to your router, the template guide bushing guides the bit through the finger template, as shown in the photo on page 49. The bushings come in standard sizes (½" dovetail bits require a 7/16" template-guide bushing; ¼" bits need a 5/16" bushing). However, you do need a bushing designed to fit your particular router base (available from the router manufacturer). Vermont American sells a universal router base/guide-bushing kit that fits most popular routers (item no. 23458).



A bit of a difference: ½" dovetail joints made with Black & Decker's dovetail bit and jig (*left*) and Sears' bit and jig (*right*).

Even though all ½" dovetail bits cut ½" dovetails (determined by the maximum diameter of the bit), you'll find a difference in the profiles of the cuts. The pin profile depends both on the bit size and the jig you're using it with. The photo at left shows the pin profiles made with Black & Decker's ½" bit and jig (*left*) and Sears' ½" bit and jig (*right*). Although the Black & Decker cuts a longer pin, both joints have the same ½" tail-pin spacing. Both make equally strong joints, but you may prefer the looks of one joint over the other.

Continued

DOVETAIL JIGS

LEIGH AND OMNIJIG: You can do even more with these two

Leigh, Omnijig, and Keller make *through dovetails*. We used the Keller 24" jig to make this one.

If you're *really* serious about dovetailing, you may want to step up to one of the more versatile, heavy-duty jigs made by Leigh Industries or Woodmachine Company (Omnijig). Both have the advantage of cutting *through dovetails* for that "hand-cut" look, but with greater precision than you ever could by hand. We tested the 16" Omnijig and Leigh's 24" improved jig. Both also cut half-blind dovetails.

Left: The Omnijig has an optional template for cutting tapered sliding dovetails. *Right*: A variation on a through dovetail — joining boards edge-to-edge. The Leigh, Omnijig, and Keller will make this type of joint.

LEIGH: A production-quality machine

The Leigh may look complex, but we found it easy to use. It has an excellent instruction manual so even a novice woodworker should have no problem setting it up. Yet, we think it's sturdy and versatile enough to satisfy the needs of a production cabinet shop.

Leigh offers a 12" and 24" version of their jig. Both models make through dovetails and half-blind dovetails. To cut through dovetails on the Leigh jigs, you rout one board at a time, using the front clamp bar only. You use two bits to make through dovetails — a dovetail bit to cut the tails (pin sockets) and a straight bit to cut the pins. The jigs come with a ½" dovetail bit and 5/16" straight bit. Leigh also offers other bit sizes (see chart on page 39) for different thicknesses of stock.

With the adjustable guide forks on the Leigh jigs (see photo at *right*), you can vary the size and spacing of the pins and tails. You just position the forks where you want them on the guide rails to get the effect you want.

Adjustable guide forks on the Leigh jigs enable you to vary the size and spacing of the pins and tails. This jig makes half-blind dovetails and through dovetails. Both 12" and 24" versions are available. The jig comes with an excellent owner's manual.

OMNIJIG: Most versatile of all

Woodmachine Company picked the right name for this jig — with it, you can cut more different types of joints than with any of the others. And it's built for a lifetime of heavy use. The Omnijig has a precision-milled, 5/8" cast-aluminum base, cam-action 1¼" steel clamp bars, and heavy-duty ¼"- to ½"-thick aluminum templates.

We found the lever-operated cam-action bar clamps exceptionally easy to use. And, the clamps exert enough pressure to actually flatten a cupped board.

The Omnijig comes with a carbide-tipped ½" dovetail bit and an aluminum finger template for ½" half-blind dovetails. You can buy optional templates for six additional types of joints (see chart on facing page).

The through dovetail template (shown in the photo at *right*) has adjustable guide forks for variable spacing. It comes with two carbide-tipped, bearing-guided bits (¾" dovetail and 3/8" straight). The rest of the templates use standard bits and router guide bushings.

The Omnijig comes standard with ½", half-blind dovetail template. The through-dovetail template (with bits) on the 16" jig shown costs an extra $125. These two templates and four additional ones are available for the 16" and 24" models.

DOVETAIL JIGS: VITAL STATISTICS

MANUFACTURER	MODEL NUMBER	CAPACITY		TEMPLATES[2]		MINIMUM ROUTER SIZE (HP)[3]	CONSTRUCTION[4]			BIT SIZES[5]		TEMPLATE GUIDE BUSHINGS[6]	SUGGESTED LIST[7]
		MAXIMUM STOCK WIDTH (IN.)	MAXIMUM STOCK THICKNESS (IN.)[1]	STANDARD	OPTIONAL		BASE (JIG BODY)	TEMPLATE	CLAMP BARS	STANDARD	OPTIONAL		
Black & Decker	52331	12	1	B	A	1	A	PH	S	½D	¼D	S	97.70
Bosch	82913	12	1	B	A	1	A	PH	A	—	3/16D,3/8D	O	95.00
Bosch	92870	16	1	B	—	1	A	PH	A	—	3/8D	O	114.50
Keller	1600	—	¾	G	—	1	—	A	—	7/16D, ½S	—	N	169.00
Keller	2400	—	1½	H	—	1	—	A	—	5/16D, ¾S	—	N	269.00
Keller	3600	—	1¼	I	—	1½	—	A	—	1D, ¾S	—	N	365.00
Leigh	D1258R-12	12	1¼	F,K	—	1½	A	S, Z	S	½D,1/16S	3/16D,1/16D,1/16D,7/16S,½S	N	299.00
Leigh	D1258R-24	24	1¼	F,K	—	1½	A	S,Z	S	½D,1/16S	3/16D,1/16D,1/16D,7/16S,½S	N	359.00
Omnijig	16	16	1	B	A,D,E,F,K,L	1	CA	A	S	½D	¾D,1/16S	N	385.00
Omnijig	24	24	1	B	A,D,E,F,K,L	1	CA	A	S	½D	¾D,1/16S	N	485.00
Porter-Cable	5008	12	1	B	A,L	⅞	S	PH	S	—	¼D,½D	O	95.50
Sears	2570	8	1	A,B,K	—	1	P	PH	S	—	¼D,½D	S	27.99
Sears	2579	12	1	A,B	C,D	1	P	PH	S	—	¼D,½D	O	49.99
Vermont American	23460	8	1	A,B	E,L	1	P	PH	S	—	¼D,½D	O	29.00

1. Thickest board jig will handle for largest joint it makes
2. Dovetails: A. ¼" half-blind B. ½" half-blind C. ¼" box joint D. ½" box joint E. Spaced half-blind F. Through, variable spacing G. 7/16" through H. 3/8" through I. 1" through J. Tapered sliding K. Half-blind, variable spacing L. Rabbeted (template required)
3. Horsepower specified by jig manufacturer; otherwise 1 hp minimum for bits no larger than ½" in diameter
4. (A) Aluminum extrusion (CA) Cast aluminum (P) Plastic (PH) Phenolic plastic (templates only) (S) Steel (Z) Zinc
5. Bit diameter (D) Dovetail (S) Straight
6. (S) Standard (O) Optional (N) Not available: see your router dealer. Bushings offered fit the routers made by the jig manufacturer. Vermont American offers universal bushing / router base
7. Prices may be discounted at your local tool dealer

FOR MORE INFORMATION:

Black & Decker (U.S.) Inc.
Call (800) 235-2000 for nearest dealer

Robert Bosch Power Tool Corporation
P.O. Box 2217, Highway 55 West
New Bern, NC 28561
(800) 334-4151

Keller & Co.
31 Terrace Ave., P.O. Box 800
Bolinas, CA 94924
(415) 868-0560

Leigh Industries Ltd.
P.O. Box 4646, Quesnel,
British Columbia, Canada
(800) 663-8932

Porter-Cable Corp.
P.O. Box 2468
Jackson, TN 38302-2468

Sears, Roebuck & Co.
For more information, contact a store in your area.

Vermont American Tool Company
Lincolnton, NC 28092-0430
(704) 735-7464

Woodmachine Company (Omnijig)
Route 2, Box 227
Mebane, NC 27302
(919) 563-2490

THE KELLER TEMPLATE SYSTEM: In a class by itself

Keller provides the templates and bearing-guided bits, and you make the "jig". Cleverly simple!

You won't find a jig simpler than the Keller. In fact, there's very little to it — just two ½"-thick, machined-aluminum templates (one for cutting the pins and one for cutting the tails). But it has several advantages over the other jigs.

First, there's no limit to the width of stock you can dovetail. When working with stock wider than the templates, you simply reposition the templates to extend the joint. Second, it's amazingly simple to use. Once you have the templates correctly positioned on their backer boards, you don't need to adjust anything. Third, it takes up no bench space.

Keller offers 16", 24", and 36" template sets. The 16" model makes joints with 7/16" pins; the 24" model, ⅝" pins. And for that *really big* project, the 36" model makes joints with 1" pins.

Each template set comes with two carbide-tipped, bearing-guided router bits, which we found made exceptionally clean cuts. The ball-bearing guides attached to the ½" shanks on the router bits eliminate the need for guide bushings on your router.

Produced by Jim Barrett, Terry Fenimore Photographs: Bob Calmer Illustration: Bill Zaun

PRESENTING
THE GUARANTEED-FOR-A-LIFE

***Texas Rockers'* old reliable — the heavy, solid ash, oversized, slat-seated rocker.**

Folks call former accountant Hugh Vaughn, 38, "Blow." That's short for "Blow Gum," the name his brother and sister tagged him with as a chubby-cheeked baby. "Blow" stuck because, in East Texas anyway, it's hard to escape a nickname. But it sort of describes his approach to life. He jumps into everything, including the family business, *Texas Rockers,* with the energy of a Texas wind blowing up a rainstorm. Like a twister, he has scattered rockers all over the Lone Star State, and the nation.

Jennie, 32, his wife, majored in art. Her persistence backs her husband up when he jumps into something. Making rocking chairs, Jennie "out-band-saws anyone two to one," Blow boasts.

We listened to their pitch at a Michigan arts and crafts fair. Then, we followed them home to Woodville, Texas, to watch them make their Texas-size, ash rockers.

TIME, TEXAS-SIZE ROCKER

Over in East Texas, on the edge of the pine and hardwood country called the Big Thicket, Blow and Jennie Vaughn turn out rocking chairs to match 10-gallon hats.

A dozen years ago, most people they knew in their Texas hometown of Woodville thought the Vaughns were a little "off their rockers." That's when Blow and Jennie chucked good, traditional jobs to make rocking chairs for a living. Now, looking back down a trail of sawdust, setbacks, and tired backs, they see their distinctively large, solidly built rockers sitting on some pretty prestigious porches.

Country singing star Willie Nelson owns one. So does George Jones. And Janie Fricke, too. Celebrated movie producer Michael Hausman bought one. Several Texas legislators relax in rockers made by the Vaughns. And the city of Fort Worth bestows them — complete with the municipal seal carved in the back — as gifts.

IN TEXAS, BIGGER HAS TO BE BETTER

Size sells in Texas, so Blow designed their rocker a third larger than the traditional. No one can say they "won't fit in it," Jennie laughs. Their solid ash, single, slat-bottomed rocker stands just over 4′ tall, measures 3′ deep and a little over 2′ across. The 20″-square seat provides a comfortable rest for a wide bottom. The back slats span 25″ to accommodate broad shoulders.

Blow makes the rocker sturdy, too. The posts, cut from 3″ square stock turned down to a 2⅝″ diameter, don't taper a fraction. Most rocker posts rarely exceed a 2″ diameter. A Texas Rocker weighs in at 50 pounds and looks stout.

Regardless of how big it is, the reputation of a rocking chair rests on its rockers. As Jennie points out, a rocking chair shouldn't pitch you over on your nose, take too much leg work to keep it rocking, or pull up short. Because Blow figured out the exact radius at which to cut their rockers, you can rest your feet up on the dowel rods and the chair keeps on rocking in a smooth, uninterrupted flow of motion guaranteed to last a lifetime.

The Vaughns' Texas Rocker has withstood close inspection, and comparison, by customers. "Once, at a crafts fair," Blow relates, "a tall-framed Texan was quizzing me about our rockers. He said that they're like the Kennedy rocker. I said, 'Well, kinda, but ours is a nicer chair. It has turned posts. It's also bigger.' At that, the man frowned and walked away. Well, about two hours later, here comes this guy carrying a rocker on his head! He sets down his rocker — that he fetched from home — next to mine and says, 'Well, I'll be, it really is bigger.' He bought a dozen."

CHIPPING AWAY AT BUILDING A BUSINESS, AND A REPUTATION

In the early days, Blow and Jennie viewed their market as just local residents and tourists who dropped by their shop at Woodville's only attraction, Heritage Garden Village and the Pickett House. They called themselves the "Old East Texas Furniture Factory."

After the first year, Blow and Jennie realized they couldn't make enough money from their tiny Woodville business to live on. So, they moved to Galveston, found "regular" jobs for a year to supplement their woodworking earnings, and made rocking chairs in the evenings.

Something besides memories of the tough row they hoed came from their time on the Gulf Coast. That's when they came up with the present name for their chairs: *Texas Rockers*. And, discovered how to market them.

"The Texas State Arts and Crafts Fair at Kerrville was our first show.

continued

The original Texas Rocker spawned a still-growing line that includes upholstered pieces, tables, and dining chairs.

Gus Lewis has mastered not only upholstery, but spitting tacks! For durability, slats, not webbing, go under the cushions.

TEXAS-SIZE ROCKER

We sold $1,700 worth of chairs at it — ash rockers for $95 and cedar ones for $125 — and were we amazed! We also realized that we could move back to Woodville again, and run our business without depending just upon tourists," Jennie explains. Today, for three to seven days at a time, between April and Christmas, the Vaughns live out of suitcases. They haul trailers of chairs to about 30 arts and crafts events throughout the country.

A WELL-PLACED ROCKER BEATS PAID ADVERTISING

Building good furniture doesn't do much except make you feel good inside unless you can keep on selling it. That's a sound business theory Blow lives by now. He's learned that advertising helps, and sometimes it's free.

A real Texas-size promoter of his Texas-size rockers, Blow once arranged to have a chair, with the state seal carved into the face of the top back, presented to the then governor of Texas, Mark White. When the governor's wife decided to sit down in her husband's lap, the room filled with camera flashes — and Texas Rockers were page one.

Front page newspaper coverage can't hurt. According to Jennie, however, it's word of mouth and satisfied customers that really sells their chairs. Usually, that happens one a time, at a price beginning at $188. Occasionally, though, they hit the jackpot with a big buyer. Blow's favorite sale involved a rancher.

"We were at a huge Texas show, and this guy came up and said, 'Give me 10 percent off each chair, and I'll take a dozen of them. Pick out your nicest 12,'" recalls Blow. He rounded them up.

Two years later Blow and Jennie were at the show again. The same rancher came up to Blow and said: "You know those rockers I bought from you? The ones they replaced I gave to my foreman. Well, in order for me to get to my place, I gotta come across his, and I'm even tired of looking at my old rockers now they're on his porch. I need four more to replace *them*! "

CHAIRS DON'T MAKE THEMSELVES WHEN YOU'RE OUT ON THE ROAD SELLING

Blow and Jennie's original slat rocker has developed into a line. By customer demand, they now make dining chairs, a dining table, a double-seat rocker, footrests for single- and double-seaters, as well as upholstered versions. Customers choose between a dark walnut and a maple stain. A spray coat of sanding sealer, a hand-sanding with 150-grit paper, and a topcoat of the Vaughns' own acrylic lacquer makes a smooth, yet durable, satin finish for their products.

Production always must go on in the shop to make chairs to sell at fairs. During the Galveston days, Blow and Jennie's nighttime labors produced seven chairs a week. In Woodville, they broke the 1,000-a-year mark in 1985, with the help of a few hired hands.

With six employees, they have work going on at every stage, from crosscutting lumber to applying the topcoat, and average about 1.2 chairs per person per day. In the assembly process, 35 pieces come together for each single rocker and 48 for each double. Each piece, except for the eight kiln-dried, ash dowel rods that connect the posts, come from their efforts.

PRACTICE, PRECISION, AND COMMERCIAL MACHINERY MAKES PERFECT

To avoid mistakes and save time, the Vaughns use jigs attached to the machinery as permanent fixtures, or templates which can be traced, for practically every piece that goes into their chairs. One of the bandsaw jigs, for example, swings into the path of the saw to guide the cut of the rocker, as shown in photo, *right*. Another, on the vertical boring machine, controls depth.

Fine-tuning production schedules or setting up jigs always takes trial-and-error experience. Moving from hobby machinery to industrial-type machines, though, was a major education process.

Blow learned a lot from an experienced woodworker in Louisiana. The man, nearing retirement and ready to sell out his commercial shop, took the young entrepreneur under his wing. On weekends, Blow drove three hours one way to "study" with him. Only after Blow learned all about a particular machine would this fatherly friend sell it to him. Since their first meeting, they have shared a few machines and the experience of a lifetime.

Today, posts are still cut, one at a time, on a Yates automatic turning

ARTS AND CRAFTS SHOWS: WISDOM FROM TRIAL AND ERROR

Blow and Jennie have learned a lot about arts and crafts shows. Here are some tips:

1 "Enter far enough ahead of time to meet the deadline, and to get your deposit refunded if you don't make it." (At good shows, booth fees go for $200 and up.)

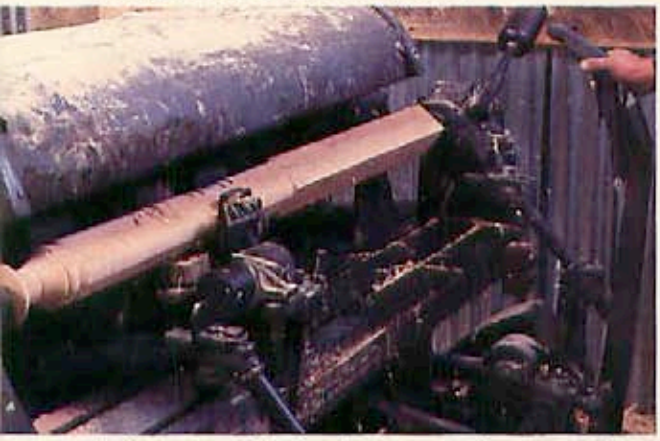
2 "Know your shows." The Vaughns know their shows and their math. At some shows they can average a sale for every 1,000 people in attendence. They work a few shows, proven to bring out chair buyers, that draw only 15,000 people. Most shows, though, draw between 50,000 and 100,000.

3 "Don't just enter every little flea market and art show in all the small towns. You'll never meet expenses."

4 "Enter more shows than you can attend." You won't get in them all.

5 "Don't spread yourself too thin." Blow and Jennie, with the help of

A large plywood jig, secured by a dowel, guides the sawing of the rocker. The jig holds the stock and moves through the cut in a circular motion.



On the automatic lathe, 3"-square stock meets 32 knives that shape the post pattern. After half the 4'-long post is turned, it's flipped over to turn the other end.

Jeri Colley brushes on a slow-drying casein glue, then assembles the pieces with the help of an ash mallet. Because of the 1½" depth of the holes and close tolerances, she uses no clamps.

lathe Blow bought from his mentor. The machine, shown in the photo *above*, turns a 4'-long post in about four minutes.

Unfortunately, instructions didn't come with the machines the Vaughns often bought at auctions. Blow, and his machinist friend, Charlie Youngblood, spent many hours working out a machine's individual quirks. For instance, there was the chain-driven, straight-line rip saw. After a professional had rewound the motor, one of the five gears mysteriously moved the lumber backward!

NEVER TIME FOR ROCKING WHEN YOU MAKE YOUR OWN CHAIRS

Blow and Jennie endured and matured during their trial-and-error stage of business. Yet, they don't plan to rest now that they're experienced. They may add a new product — a "nanny" rocker. That's a baby cradle that rests on rockers and attaches to the arm of a full-size rocking chair. The "nanny" cradle will come off its rockers to be used elsewere as a bassinet. Also, in the office, they're facing the challenge of computerizing the books.

Blow and Jennie, like most folks, would like to work a little on working less. They're trying to refine the business so they can occasionally head home before dark. They look forward to someday enjoying the fruits of their labor — and perhaps being able to put their feet up once in awhile and rock for a spell.

friends, have been known to set out for five shows on a weekend. But, the odds won't be with you. Now, they might do three at once, because there always seems to be a good show, an OK show, and a dud.

6 Send in professional photographs (35mm slides are the standard) for juried shows. "The judges will tell you that they're judging your work, but you learn that the quality of the photos you send in matters."

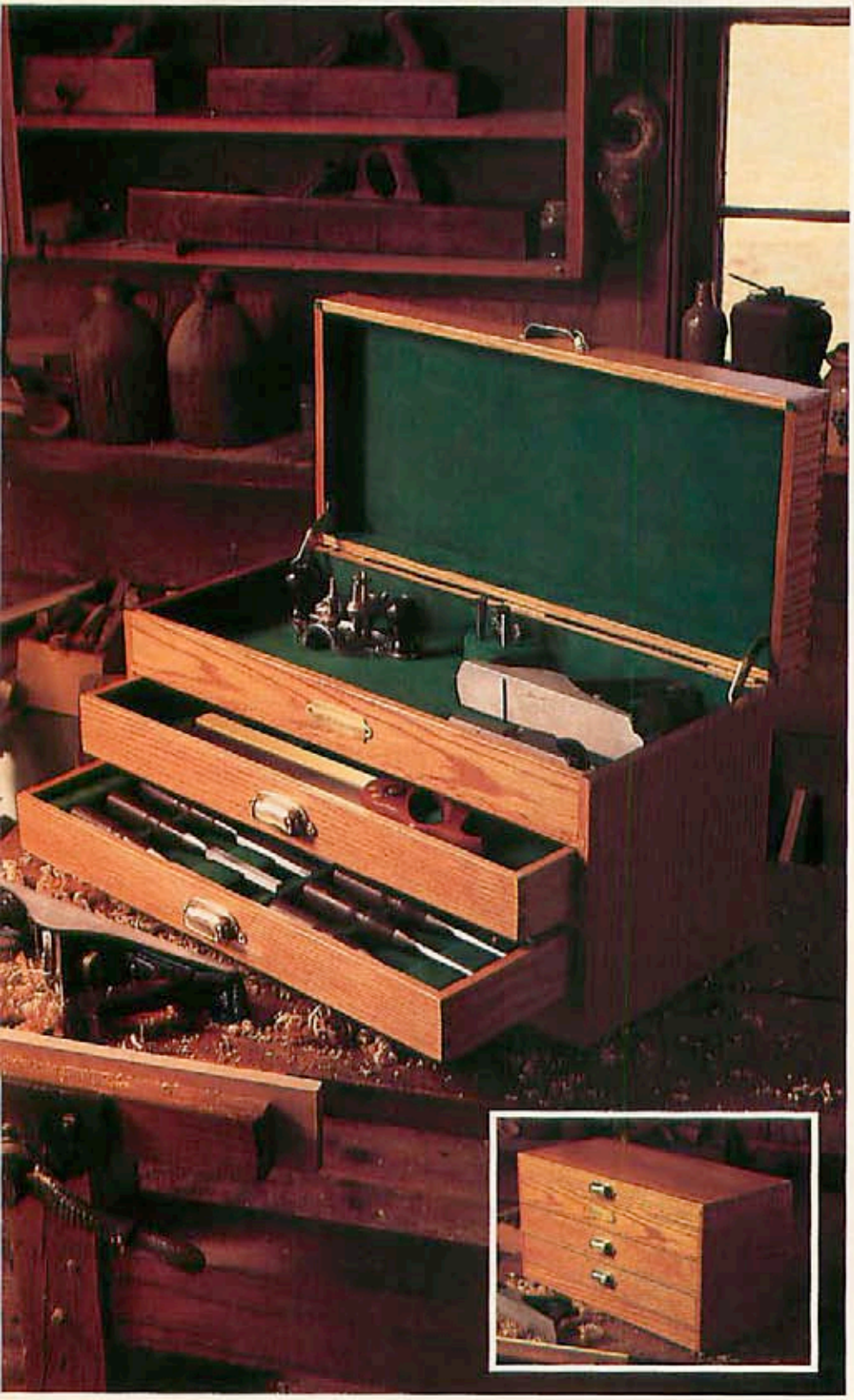
7 Study the show before you go. The Vaughns get details on different shows through a newsletter (See *WOOD*, February, 1987, for sources). They also ask fellow exhibitors for a personal rating.

8 Keep track of every detail. Jennie maintains a log listing every show — from entrance requirements to hotel bookings.

Written by Emily Freeman Pinkston
Photographs: Bob Hawks

A TRADITION REVIVED

WOODWORKER'S TOOL CHEST



In days gone by, to become a journeyman woodworker, an apprentice had to pass one final test. He had to use his new skills to craft a tool chest. If his master approved of his work, the apprenticeship ended, and the chest became a sales tool to show a prospective client the journeyman's talent.

Our bench-top chest recalls that tradition. And, it's designed to keep your fine cutting tools sharp in addition to showing off your skills as a craftsman.

Note: *We used a Sears dovetail jig and router to cut the dovetail joints. Read the article on page 48 for detailed information on setting up and using the jig.*

GLUING UP PANELS FOR THE BOX

1 Rip and crosscut enough ½" oak stock for the top (A), sides (B), and drawer shelves (C). Edge-join the stock so each panel measures 1" extra in length and width. (To ensure stability, we edge-joined three narrower pieces for each panel.)

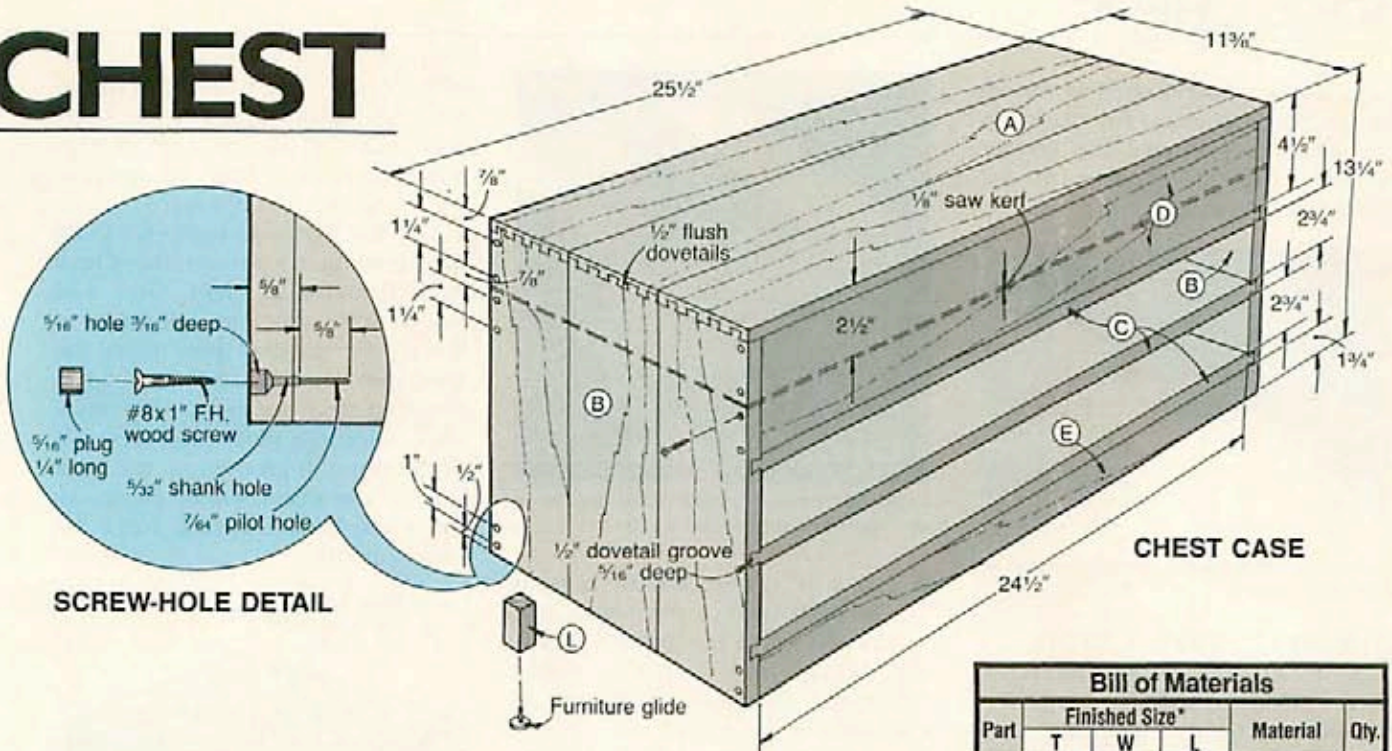
2 Later, scrape off the excess glue, cut the panels to finished size, and sand smooth. Check each panel for flatness and plane if necessary.

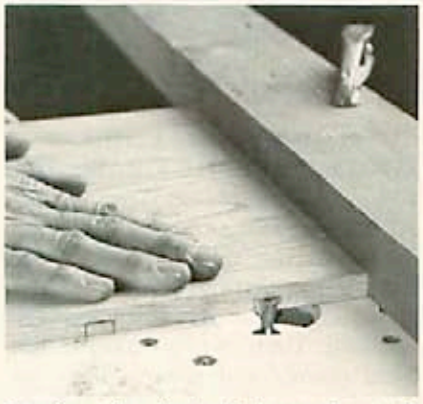
DOVETAILING THE CHEST CASE PARTS

1 Set up the dovetail jig and router to cut ½" dovetails, using the procedures on page 48. To ensure proper jig and bit settings, test-cut dovetails in scrap stock the same thickness as the case sides and top *before* cutting the actual parts. (Jig cut dovetails seldom come out perfect the first time, so we recommend test cutting on scrap first.)

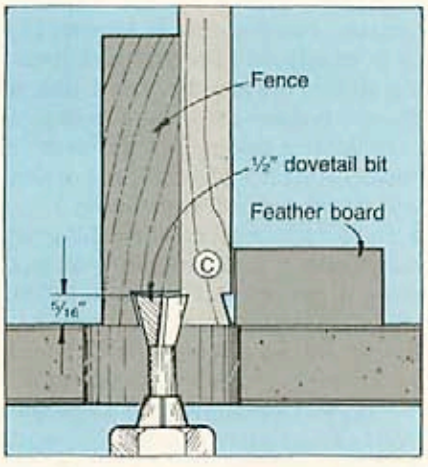
2 Cut dovetails on both ends of the top (A) and the top edge of each

CHEST





Routing the first of three dovetail grooves in the side pieces



Bill of Materials

Part	Finished Size* T	W	L	Material	Qty.
A*	½"	11⅜"	25½"	oak	1
B*	½"	11⅜"	13¼"	oak	2
C*	½"	11⅛"	25⅛"	oak	3
D	½"	4"	24½"	oak	2
E	½"	1¾"	24½"	oak	2
F	½"	2 11/16"	24 7/16"	oak	2
G	½"	2 11/16"	10 13/16"	oak	4
H	½"	2⅛"	23 15/16"	oak	2
I	¼"	10¼"	23 15/16"	oak plywood	2
J	½"	½"	20"	oak	2
K	¼"	7"	24½"	oak plywood	1
L	¾"	¾"	1⅝"	pine	4

*Parts marked with an * are cut larger initially, and then trimmed to finished size. Please read the instructions before cutting.

Supplies: #8x1" flathead wood screws, #6x⅜" brass flathead wood screws, ¾"x17 brads, ¾"x17 wire nails, 3 — 1½x3" brass flat pin hinges, paraffin, 1/16x1x3⅝" brass with two #4x⅜" brass flathead wood screws for nameplate, 4 — furniture glides, stain, finish

side piece (B). Keep the dovetail jig set up — you'll use it again later for dovetailing the drawer parts.

3 To cut the dovetail grooves in the side pieces, mount a ½" dovetail bit in a table-mounted router. Raise the bit 5/16" above the surface of the router table. Mark the location of the three dovetail grooves on the front edge of *one* of the side pieces where dimensioned on the Chest Case Drawing *above*. Adjust the fence to align the bit with the marked groove. Now, rout a ½" dovetail groove on the inside face of *each* side piece as shown in the photo *above*. Reposition the fence and cut the next set of grooves. Repeat the process for the third set of grooves.

4 To cut the dovetail pin on each end of the drawer shelves, reposition the fence so the dovetail bit is positioned as shown in the drawing *above*.

5 Rout *one face* of each drawer shelf and a scrap piece of ½" oak about 6" long. Clamp a feather board to the router table to help hold the shelf firmly against the fence and dovetail bit when routing the dovetail pins.

6 Now, rout the *opposite face* of the scrap piece and check the fit of the scrap pin in the dovetail groove. Reposition the fence if necessary, and rout the second face again until the pin fits snugly into the dovetail groove. Set the scrap piece with the correctly sized routed dovetail pin aside, you'll cut pin plugs from this for the case back later. Finally, rout the other

Continued

face of each drawer shelf as shown in the photo *below*. (For clarity in the photo, we moved the feather board to the side to show the bit and the shelf being cut.)

Routing a dovetail pin along one end of a drawer shelf

ASSEMBLING THE CHEST

1 Cut the oak front and back pieces (D, E) to size.

2 Glue and lightly clamp the sides (B) to the top (A), checking for square. (We applied the glue to the tails and pins with a small brush.)

3 Run a bead of glue down each dovetail groove. Slide the drawer shelves (C) into position, *flush* with the front edge of the chest. Glue and clamp the front and back pieces (D, E) into position.

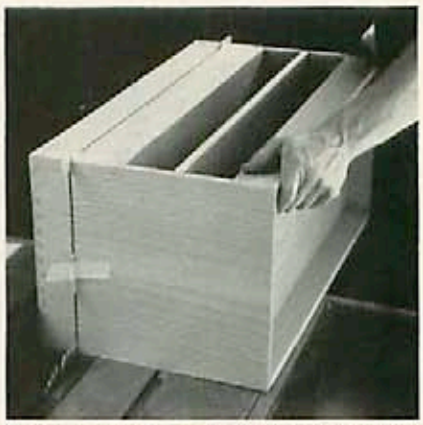
4 Drill holes through the chest sides (B) into the ends of parts D and E, using the hole sizes stated in the Screw-Hole Detail shown on the Chest Case Drawing. Drive the screws. Cut plugs with a plug cutter, and glue a plug in place over each screw, matching the grain direction of the plug with that of the side piece. Sand the plugs flush later.

5 To saw the lid, position the fence 2½" away from the inside face of the blade. Start the saw and cut the two ends and one face. Tape ⅛"-wide spacers in the saw kerfs where shown in the photo *above right*, and make the final cut.

BUILDING AND FITTING THE DRAWERS

1 Cut the drawer fronts (F), sides (G), and backs (H) to size.

2 Using the same jig setup as before, dovetail both ends of each drawer front and the front end of each side.



Cutting the top from the chest case; note the spacers taped in the kerfs

3 Cut a ¼" groove for the bottom (I) in each drawer front and side where shown in the Drawer Drawing *below*. Now, cut a ½" dado ¼" deep ½" from the back edge of each drawer side.

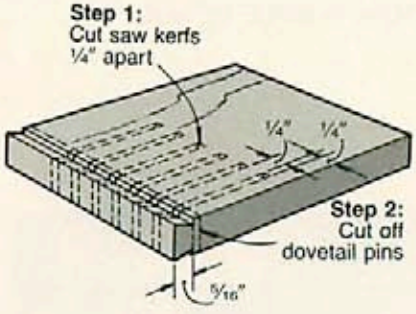
4 Glue and clamp each drawer together, checking for square. Quickly, cut the drawer bottom (I) to fit snugly into the grooved opening. Before the glue has dried, slide a drawer bottom into the grooves in each drawer, and nail to the drawer backs (H). (A squarely cut bottom will square up a drawer frame.)

5 Sand each drawer, smoothing all sharp edges. Belt-sand the drawer sides if necessary for a smooth fit into the chest drawer openings.

6 Cut the drawer stops (J) and guides to size. Slide the drawers into the drawer openings and align the *front* of each drawer with the *front* of the chest. Now, working from the *back* side of the chest, glue the stops and guides to the drawer shelves, positioning them flush against the back edge of each drawer.

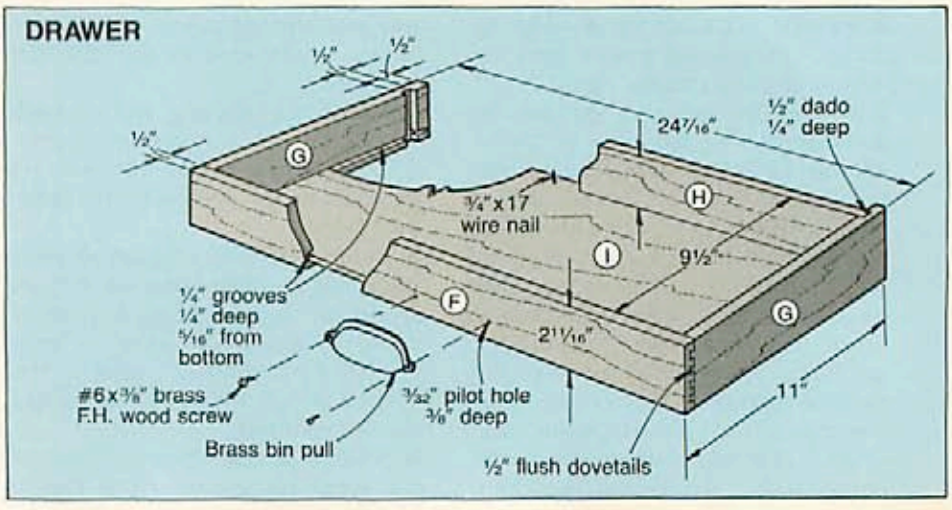
7 Cut the plywood back (K) to fit the opening shown on the Chest Back Drawing at *right*. Glue and nail the back piece into position.

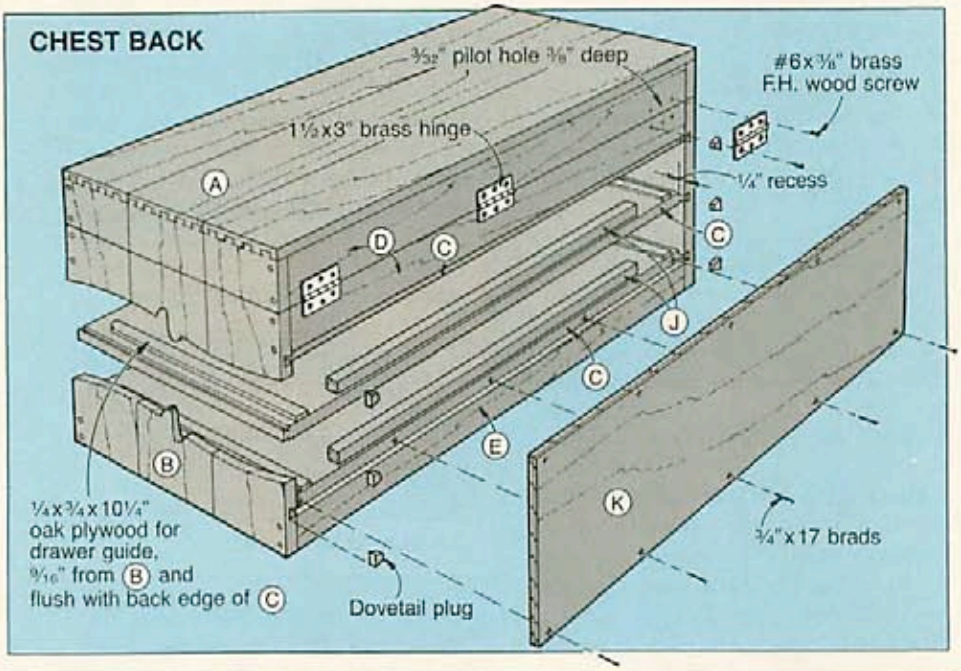
8 Cut the dovetail pins from the scrap pin you cut earlier, using the two-step drawing *below* for reference. Glue the plugs into the ends of the dovetail grooves on the back side of the chest where shown in the Chest-Back Drawing. Sand the plugs smooth.

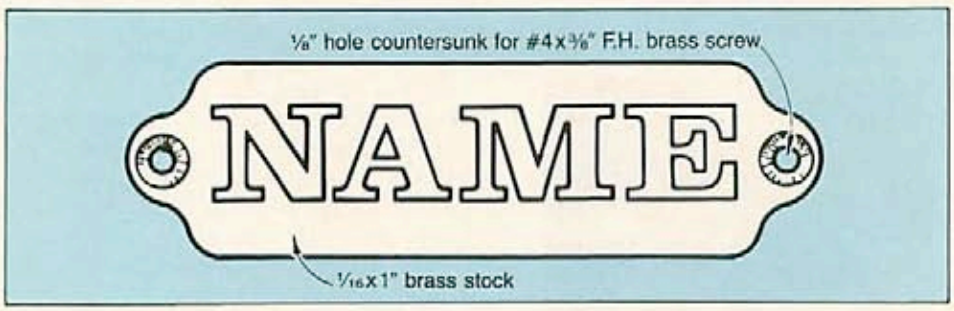


CUSTOM-FITTING YOUR TOOLS INTO THE DRAWERS

1 To make the recessed holders for our hand planes and router plane as shown in the opening photo, we started by cutting a piece of ¼" plywood to fit snugly inside the top opening. Then, we positioned our hand planes and router plane on the plywood, traced their outlines, and cut out the stock inside the







outlines with a scroll saw. Next, we glued the ¼" plywood to the top of the top drawer shelf (C). Finally, we cut a semicircular block, drilled holes in it to hold the cutters for the router plane, and glued and clamped it in position.

2 To hold the hand saws in position in the top drawer, we cut three ¾x¾x9½" oak strips. We then positioned the strips between the drawer front and back, laid the saws on top of the strips, and marked the portions of the strips covered by the saws. Next, we dadoed away the marked areas deep enough so the saws fit into the dadoed recesses. Finally, we glued the strips to the drawer bottom.

3 For the chisels stored in the bottom drawer, we cut two oak strips ½x¾x9½" for the chisel handles and two strips ¾x2x9½" for the chisel blades. We positioned the strips and chisels in the drawer and marked the portions of the strips that were covered. We dadoed away the marked areas for the blades, and, using a scroll saw, cut curved recesses for the handles. Finally, we glued the strips in position. We also cut dividers to place against the chisel handles to keep the chisels from sliding when opening and closing the drawer.

FINISHING TOUCHES

1 Cut four furniture-glide supports (L) to size, then glue and clamp one support in each bottom corner.

2 To attach the lid, position it squarely on the chest (we clamped ours in position). Using double-faced tape, tape the hinges in position to the back of the chest. Drill holes to the sizes given on the Chest Back Drawing, remove the tape, and attach the three hinges. Open the lid and attach the two *lid* supports. Attach the bin pulls.

3 Remove the hardware and sand the chest case, lid, and drawers smooth. If you plan to flock the top opening and drawer interiors as we did, sand a slight round-over on all exposed edges of the recessed openings and tool supports. (The flocking doesn't stick well to sharp edges and wears off faster.)

4 Apply stain and finish to the chest (we used spray-on lacquer).

5 Mask off the drawer and top-opening tops and sides. Apply flocking to the drawer interiors following the directions supplied with the flocking. (See the Buying Guide for our source of flocking.)

6 Apply paraffin to the bottom edge of each drawer for smooth operation.

7 To make the nameplate on the front of the chest, we cut a piece of 1/16" brass (available at most hobby stores) to shape using the full-sized pattern at *left*. Next, we drilled the mounting holes, filed and sanded the cut edges, and had a trophy shop do the engraving.

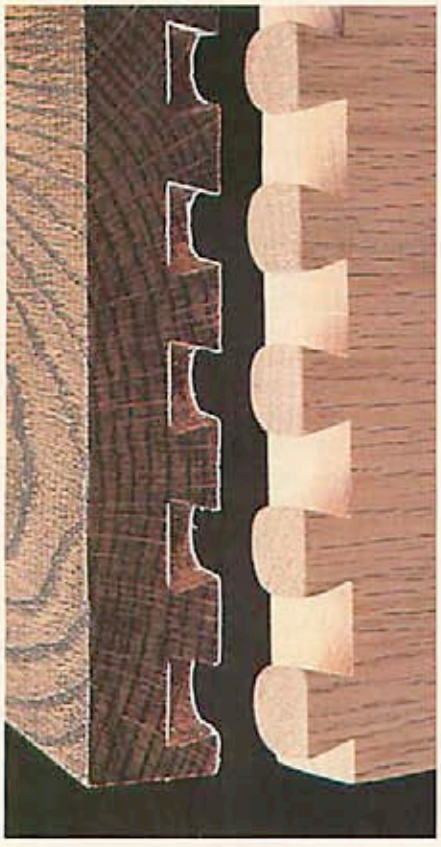
8 Reattach all hardware. Finally, attach the furniture glides to the bottom of the supports (L).

BUYING GUIDE

- **Bin pulls (3).** Made of cast brass, catalog no. E2203, $7.95 each, $2.50 handling. The Woodworkers' Store, 21801 Industrial Blvd., Rogers, MN 55374-9514, or call 612/428-2199 to order.
- **Lid supports (2).** Made of steel and brass plated. Catalog no. D9400, $1.50 each, $2.50 handling. Woodworkers' Store, address above.
- **Suede-Tex flocking.** Spray gun, catalog no. 25, $21. 3 oz. kelly green flocking fibers, catalog no. 600-3, $4.50. 8 oz. kelly green undercoat adhesive, catalog no. 800-8, $4.50. All three items for $30 plus $4 shipping from Donjer Products Co., Ilene Ct., Bldg. 8W, Belle Mead, NJ 08502 or call 201/359-7726 to order.

Produced by Marlen Kemmet
Project Design: James R. Downing
Photographs: William Hopkins; Bob Calmer
Illustrations: Kim Downing; Bill Zaun

How To Make Picture-Perfect Joints With Your DOVETAIL JIG



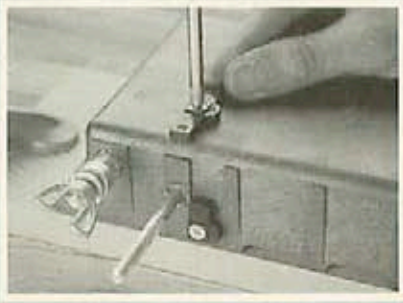
As soon as we started testing the dovetail jigs for this issue's buymanship article (pages 34-39), we quickly learned one thing: you can't just clamp in the stock, start routing, and expect to get perfect joints. In fact, while setting up the first few jigs, we almost lost our cool trying to get them adjusted. But, with patience and practice, we caught on. And that's the whole secret to using a dovetail jig.

In this article we show you how to set up the Sears 12" jig (model no. 2579) to make ½" dovetail joints for a typical flush-front drawer. You can use these basic instructions to dovetail the drawer fronts and carcass of the tool chest project on pages 44-47.

The jigs made by Black & Decker, Porter-Cable, Vermont American, and Bosch also work about the same way as the Sears we used. So, if you own one of these jigs, you can follow these instructions, along with those in your owner's manual, to make perfect joints every time.

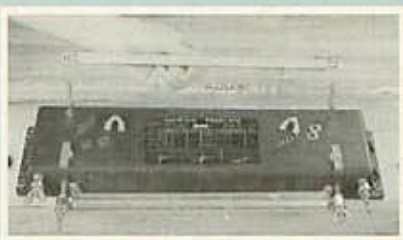
FIRST, SET UP THE JIG

1 Mount the jig on a ¾"-thick wooden base, then clamp the base to your bench. Next, set the left- and right-hand guide stops on the front and top of the jig's template base to make ½" flush joints, as shown in photo A.



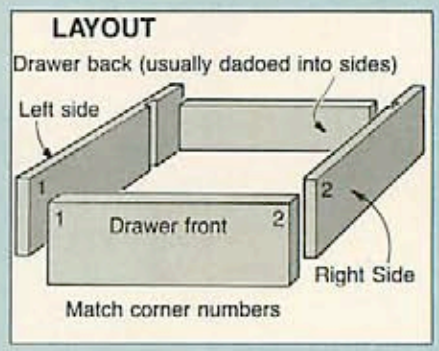
A Set guide stops for ½" flush joints (position "A" on jig).

2 Attach the top and front clamp bars. We found that the top clamp bar on our jig did not grip the drawer pieces securely enough. (We solved the problem by attaching a strip of sandpaper [120- or 150-grit] to the underside of the bar with double-face tape, as shown in photo B.)



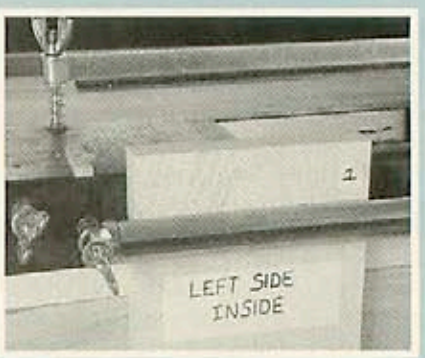
B We taped a sandpaper strip to top clamp bar to improve grip.

3 After cutting the drawer front and sides to size, lay them out as shown on the Drawer Layout Drawing, *below*. With a pencil, label each one (drawer front, left side, right side). Then, label the inside and outside faces of each, and number the ends, as shown on the drawing.



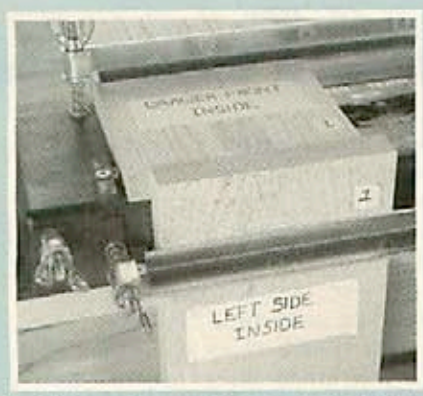
Now, cut two *test* pieces to the same size as the *left-side* and *front* drawer pieces, and label them. Use these pieces to test and adjust the jig to make the left-corner (labeled "1" on the drawing).

4 Temporarily clamp the *left-side* test piece, inside surface facing out, vertically in the jig, as shown in photo C. Butt this piece firmly against the left side guide stop. Extend it about ½" above the top of the template base, as shown.



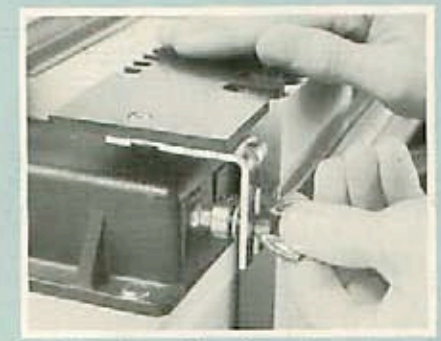
C Clamp left drawer side vertically, against the left guide stop.

5 Clamp the *drawer front* test piece, horizontally, with the *inside* surface facing *up*. Butt it against the side piece and the left top guide stop. Loosen the front clamp bar, and slide the side piece up until it's flush with the top surface of the drawer front as shown in photo D. Tighten the front clamp bar.



D Clamp drawer front against drawer side and left stop.

6 Mount the jig's ½" template on the base. (If your jig has a two-sided template like the Sears, mount it so the ½" fingers point toward you.) Position the template to cut ½" flush dovetails, as specified in your owner's manual. To do this on the Sears jig, you install the spacers and washers *between* the template brackets and template base in the order shown in photo E. Lower the template until it rests on the surface of the drawer piece, then tighten the template-bracket wing nuts or knobs.

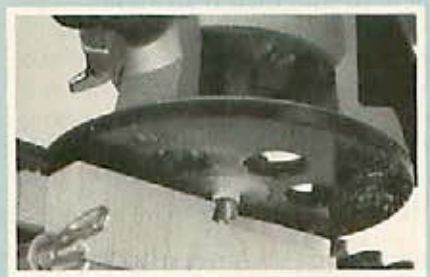


E Attach template. Note the nut, spacer, and washer sequence.

ROUTING THE DOVETAILS

1 Install a 7/16" template-guide bushing and ½" dovetail bit in your router. If you don't have a 7/16" bushing to fit your router base, you can get one from the router manufacturer. It will work on all the jigs mentioned in this article. Set the bit to the depth specified in the owner's manual.

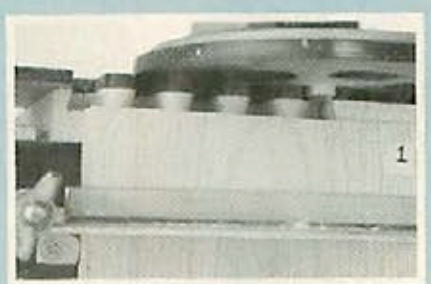
2 Place the router on the template, to the right of the test pieces. Turn on the router and rout a groove across the edge of the left-side piece, moving from right to left as shown in photo F. (We made this cut to help prevent chipping when routing the pins in the next step.)



F Rout a groove, right to left, across top edge of drawer side.

Note: *Don't lift the router off the template until you've completed Step 3. Before removing it, turn off the router, wait until it comes to a stop, then slide the base off the template. If you lift or tilt the router with the bit still turning, it may damage the template fingers.*

3 Now, rout the test joint, cutting from left to right. Let the template guide bushing follow into the template fingers, as shown in photo G. Stop the router when you've routed all fingers. Then, remove both test pieces from the jig, flip them over, and assemble the joint to test the fit.



G Guide router through template fingers; work left to right.

DOES THE JOINT FIT? IF NOT, TRY AGAIN

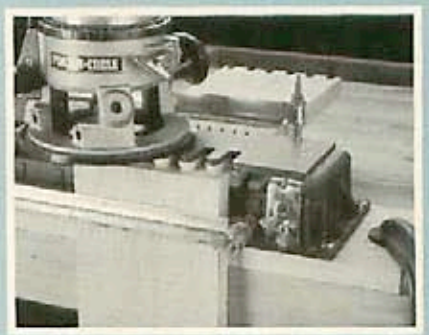
1 If the joint fits perfectly, congratulations! Skip the next three steps, and rout the finish drawer pieces, as described in Step 4 *at right.*

If the joint fits too loosely (sloppy), you have to *increase* the router bit depth slightly (about 1/64"). If it's too tight, *decrease* the bit depth by the same amount.

2 If the pins protrude from the pin sockets, you adjust the template farther back on the jig base. This will allow the router to cut deeper into the drawer front piece. Conversely, if the pins recess into the sockets, you adjust the template forward on the jig base. On the Sears jig, you do this by tightening or loosening the adjusting lock nuts on the left- and right-hand sides of the jig (behind the template-bracket spacers shown in photo E).

3 After you've made the adjustments in Steps 1 and 2, saw off the pins and tails of your test pieces, making sure you cut the ends perfectly square. Now, clamp the squared pieces in the jig and rout another test joint. If necessary, repeat the "adjust and test" process until you rout a perfect joint.

4 When you have the jig adjusted, you can dovetail the actual drawer parts. First, rout the drawer front and the left side piece on the left-hand side of the jig. Then, follow the same procedure — but this time, clamp the parts into the right-hand side of the jig — to join the other end of the drawer front to the right side piece, as shown in photo H.



H Use right side of jig to make joint 2 (see the drawing on facing page).

Note: *In theory, once you've adjusted the jig, it should make perfect joints on both the left- and right-hand sides. However, we suggest you also make a test cut on the right-hand side just to make sure. (Several times we had to adjust the right-hand side of the template because it wasn't square.)*

Produced by Jim Barrett
Photographs: Bob Calmer
Illustration: Bill Zaun

WE JUST HAD TO ASK:

DO REAL WOODWORKERS

"I built it myself," kit builders proclaim. Now, is that stretching the facts or a rightful boast? We tracked down several build-from-a-box devotees to find out.

Bill Lozier, a Des Moines-based residential heating and cooling contractor, says, "Kits are like a good book. You hate coming to the end." He's built three grandfather clocks so far, and with each one he "found a little bit more to do" to prolong its completion.

Bill's case isn't unusual at all, according to Robert H. Taupeka, president of Emperor Clock Co., a kit manufacturer in Fairhope, Alabama. Many of his customers actually get hooked on kits. "I know of a minister who orders from us. So far he has built 136 of our clocks!"

But why? "Because our kits are high quality, have old-time traditional style, take less time and effort than building from scratch, and carry a moderate price," replies Mr. Taupeka.

In Bill's case, those reasons were just a part of his decision to build a clock kit. "I bought my first kit because, at the time, I didn't have the ability to cut and machine wood. It was an easy way to get into woodworking without having a shop," he explains.

What about the value aspect? Do kits represent a bargain? To Bill, they do. "I paid around $600 for my cherry grandfather clock kit, including the movement. Looking around the stores, I'd say it would sell for $2,500 to $3,000."

Come on, though, Bill, do you feel that kit building is real woodworking? "Certainly. Not everyone could do this," he replies matter-of-factly. "Maybe you don't have to use joinery, or make precision parts, but you use the woodworking thought process and manual skills. What do you want? When someone knits a sweater, you don't expect them to spin their own yarn!"

Bill bought a Shopsmith Mark V about a year ago, but says he's not yet expert enough to make all the parts he finds in a kit. "In 10 years, though, all the furniture in our house I'll have made — about half kits, half from scratch."

WHO BUILDS FROM KITS, ANYWAY?

According to Louise Christoffers, of the Bartley Collection, Ltd., in Easton, Maryland, customers ordering their antique reproduction furniture kits fall into these general categories:

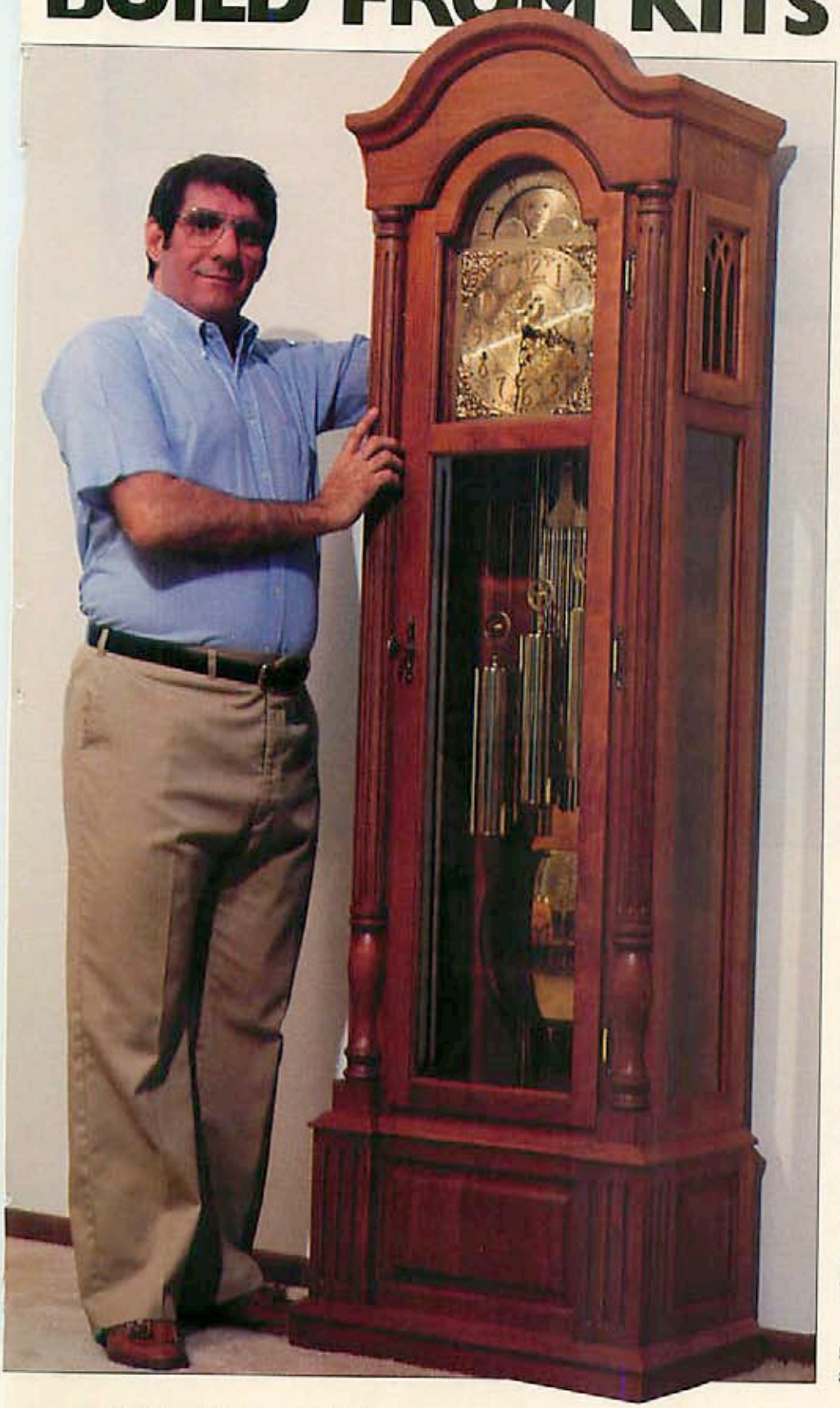
- Married and unmarried people who appreciate quality furniture but would rather build it themselves than pay high retail prices.
- Professional and business people with little time but who enjoy making something.
- Retirees who can't build from scratch because they're short of space or the necessary tools, but still like the accomplishment of building something first-rate.

Not unlike clock kit maker Bill Lozier, kit builders usually don't have a shop because they can't yet afford one, no longer need one, or wouldn't — and even couldn't — spend that much time in one. Yet, they have the desire, and the aptitude, to craft quality with their hands. Kits fill this need, and continue to be popular. Says Emperor Clock's Taupeka: "We have close to 400,000 *repeat* customers."

To Bill Lozier, kit building is very much woodworking: "You don't expect someone who knits a sweater to spin their own yarn, do you?" ▶

Bill raves about the carefully machined parts he's found in kits. And, he vows, he'll learn how to make them all himself one day.

BUILD FROM KITS???



KIT BUILDERS GET WHAT THEY PAY FOR

Most manufacturers offer furniture kits of traditional and classic styles — Colonial, Queen Anne, Chippendale, and Shaker, to name the most popular. Many kits are based on original museum pieces that would be worth thousands. As an example, a replica kit of an $8,500 Queen Anne end table might only cost you $300. It will be historically correct down to the last detail, and feature fine hardwood, hardware, and often the glue and finish.

Then again, a few manufacturers aim at those who will be satisfied with less. Their lower-priced offerings may have parts of less choice cabinet woods, and often lack machined detail. You'll probably have to buy your own finishing materials, and the glue as well. In kit furniture, at least, the old saying "you get what you pay for" rings true.

All clock kit companies offer you an assortment of complete kits. From some, you can also order turnings and moldings to complete a case you made yourself. Among clock kit manufacturers, quality generally runs high. All clock kit manufacturers offer options in movements that range from the standard to the deluxe.

KIT BUILDERS CONSTRUCT CAREERS, AND FURNITURE

Dick and Karen Menz, of Boise, Idaho, represent the young professionals who take time from climbing the career ladder to build kit furniture. The Menzes have one young child, another on the way, a new house, and two careers.

Dick admits that he's a striver in his profession, but manually illiterate. Yet, he enjoys working with his hands. And he won't compromise on the quality of his furniture. "I can't stand a do-it-yourself project that looks like one," he says.

That's the reason he chooses kit furniture. A tilt-top table that he's assembled would be the envy of

Continued

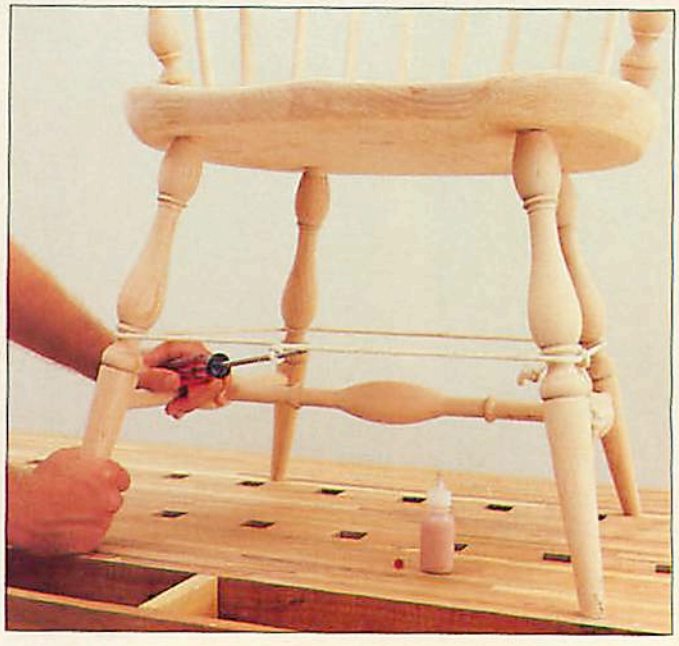
BUILD FROM KITS?

Right. Dick and Karen Menz take time out from their careers to build kit furniture. The Shaker rocker and the Windsor chair are two of a dozen pieces they've made. Dick and Karen want quality furniture, but don't want to pay high retail prices for factory-made pieces. Besides, they enjoy the hands-on experience, and have even bought a wood lathe for turnings.

Below left. For less than $200, Cohasset Colonials will sell you a museum-quality reproduction of a 1770 Henzey bow-backed Windsor arm chair, in kit form.

Except for final finishing material, they send you everything you need, and guide you through the process, step by step.

Below right. Kit builders learn how furniture goes together, but avoid the often costly mistakes faced by a build-from-scratch woodworker. Techniques, such as using a rope tourniquet to "clamp" glued chair legs, are spelled out in the instructions, saving trial-and-error disappointments.



CLOCKS OR CREDENZAS IN A BOX? HERE'S WHERE AND FROM WHOM!

CLOCKS

Craft Products Co., Dept. W, P.O. Box 326, Clintonville, WI 54929. Catalog, $1. 715/823-5136.

Emperor Clock Co., Dept. W, Emperor Industrial Park, Fairhope, AL 36532. Catalog, $1, includes traditional furniture. 205/928-2316.

Kuempel Chime Clockworks and Studio, Dept. W, 21195 Minnetonka Blvd., Excelsior, MN 55331. Catalog, $2, refundable. 1-800/328-6445.

Mason and Sullivan Co., Dept. W, 586 Higgins Crowell Rd., West Yarmouth, MA 02673. Catalog, $2. 617/775-4643.

Svoboda Industries, Dept. W, Highways 42 & 29 North, Kewaunee, WI 54216. Catalog, free, includes furniture. 414/388-2691.

Viking Clock, Dept. W, P.O. Box 1139, Fairhope, AL 36533. Catalog, free. 1-800-321-1089.

Westwood Clocks N' Kits, Dept. W, 2850B E. 29th St., Long Beach, CA 90806. Catalog, $1. 213/595-4981.

FURNITURE

American Forest Products, Dept. W, P.O. Box 8220, Stockton, CA 95208. Catalog, free. 1-800/344-3237.

The Bartley Collection, Ltd., Dept. W, 3 Airpark Dr., Easton, MD 21601. Catalog, free. 1-800/227-8539.

Cohasset Colonials, Dept. W, 497JX Ship St., Cohasset Harbor, MA 02025. Subscription to catalog series, $2. 617/383-0110.

Colonial Williamsburg, Dept. W, Box CH, Williamsburg, VA 23187. Catalog, $1. 1-800/446-9290.

Craftsman's Corner, Dept. W, P.O. Box AP, 4012 NE. 14th St., Des Moines, IA 50302. Catalog, free. 515/265-3239.

Shaker Workshops, Dept. W, Box 128, Concord, MA 01742. Catalog, $1. 617/646-8985.

The Shop, Dept. W, Box 311, RD 3, Reading, PA 19606. Free brochures, includes hardware. 215/689-5885.

Yield House, Dept. W, Rte. 16, North Conway, NH 03860. Catalog, free. 1-800/258-4720.

any fine-furniture buff. In fact, when his mother saw the finished result, she finally believed he wasn't wasting his money on kits.

So far, the Menzes have built about a dozen different projects from three different kit companies. They share the work — Dick assembles and finishes, and Karen does the sanding.

But do they feel like real woodworkers? "Yes!" Dick exclaims, "because over half of any woodworking project involves sanding, assembly, and finishing." Karen adds: "Kits give you hands-on experience with what you need to know if you were going to build it from scratch. More importantly, though, you get the feel for assembly."

MEDICINE FOR THE MIND; A RETIREE'S NEW HOBBY

Between his Boise office and St. Alphonsus Hospital, physician Robert Polk spends 60 hours a week practicing internal medicine. In his spare time, furniture kits allow him to work with his hands and exercise a different side of his mind. His demanding schedule just doesn't allow him the leisure to build furniture from scratch.

Robert says, though, that he experiences the same frustrations as a build-from-scratch woodworker. "Sometimes the instructions make assumptions and don't detail every step," he explains. "However, by starting slow and trying small projects, I'm learning the techniques."

Farther west, retiree Jim Donnelly, of Canyon Lake, California, just completed building his own house. But until recently, he had limited his woodworking projects to rocking horses for his grandchildren. That was until he saw his first kit furniture catalog. He immediately ordered a small drop-leaf table.

Now, Jim beams with pride when he looks at his masterpiece, yet admits "it was a little like assembling a Chinese puzzle." He used the finish that came in the package, and it turned out "real professional."

TO BUILD OR NOT TO BUILD?

Ask yourself that question, and you'll no doubt think of problems that might crop up. Such as, "What if the company goofs?" Surprisingly, not one of the kit builders we talked to had ever had a problem with broken, mismatched, or missing parts. But, should there be a problem with a kit you order, call the manufacturer's customer service number listed in their catalog. "We keep a huge parts inventory," advises Mr. Taupeka. "Call for a replacement part, and we'll send it the next day, at no charge. That is, unless the part got chewed up by your dog. Then, we charge."

However, at least one manufacturer does better than that. Audrey Kuempl McGregor, of Kuempl Chime Clockworks and Studio, a three-generation-old clock-kit company in Excelsior, Minnesota, says, "Even if you goof, we'll send a free replacement part."

Kit manufacturing companies aim to please, even to sending your money back. With the majority of companies who operate by mail-order, if you're not satisfied with what you receive, send the complete kit back, in its original carton, within 30 days, for a full refund.

So, you didn't learn woodworking at your father's knee? You say you missed shop class? No extra time and little space or cash for your machines and shop? You're afraid of trial and error? Kit building just might be your beginning to a woodworking hobby. Let the manufacturer bear the burden of design, mistakes with costly hardwoods, equipment, and machining. You have all the fun!

Photographs: James Cobb, David Donnelly, Cohasset Colonials.

TIMBER!

Oregon craftsman Russ Osterloh advertises for hardwood trees "dead or alive." Aided by his trusty chain saw, he brings them in. Then, he mills the timber for his custom furniture.

After a stint as an architect, Russ Osterloh settled into woodworking, the craft that paid his way through college. He raised tuition money with rolltop desks he made from wood he harvested and dried himself. Now, hundreds of furniture pieces and a 12,000-square foot shop and showroom later, he still prefers doing it all himself.

In the eastern Oregon town of La Grande, he designs and builds furniture from local wood he cuts, mills, and processes for maximum color and figure. Ash. Elm. Myrtle. Walnut. That's why, when someone has a tree to come down, Russ makes tracks with truck and chain saw.

UNIQUE WOOD FOR FINE FURNITURE MEANS QUALITY CONTROL FROM STUMP TO FINISH

"Mills plain-saw logs for maximum yield, then kiln-dry the lumber," says Russ. "I mill for figurative grain and air-dry everything for natural richness of color." To get the figured boards he wants, quality control begins with finding, then felling the tree.

Russ advertises for hardwoods with no-nonsense copy that reads: *WANTED: DEAD OR ALIVE, HARDWOOD TREES. REWARD OFFERED.*

Farmers and townsfolk up and down the mountain-bordered, agricultural valley respond. Russ inspects every candidate.

Experience and an eye for defects tell Russ which trees will make good lumber. "If there's any doubt, I call in the local forester to check it out thoroughly for me before I do any cutting," he admits.

Russ understands yield, too: "I don't use the 2-4" of sapwood in black walnut. So, on a 24"-diameter tree I'll only get 16-20" of heartwood suitable for sawing. A tree with a 3'-diameter trunk and no branches for the first 14' means I can count on about 600 board feet."

Once Russ decides to take a tree down, he sets a day, rounds up friends, and lines up equipment. For most felling, he uses a chain saw fitted with a 32" bar and a standard-tooth chain. Friends clear brush at the site and cut branches. His dad's pickup truck with power winch provides extra "convincing" for a tree to fall one way or another. For large trees (or several) Russ hires a backhoe, operator, and a flatbed truck to load and haul the logs.

Learn how to fell a tree safely by following Russ at work on logging day in the photo sequence *below*:

MAP A ROUTE, FOR YOU AND THE TREE

At the edge of a farm field where this large walnut stands, Russ studies the tree and the terrain. He asks himself some questions: "Where should it fall? What obstacles will block its fall? Will any branches that might interfere with the fall have to be cut off? Which way will *I* go when it falls?"

While helpers clear surrounding brush, Russ uses the chain saw and a sound cutting technique to remove branches that will be in the way. "First, make an undercut about

Limbing with an undercut and an overcut prevents splitting wood.

Russ's first horizontal cut at the base establishes the tree's line of fall.

one-third of the way through the branch with the top of the chain-saw-bar," he instructs. "Finish the job with an overcut on the topside. The first cut reduces stress on the branch and keeps it from splitting after the top cut severs it."

Whenever possible, Russ fells a tree in the direction of its lean. When that's impossible due to obstacles his helpers can't clear away, he calls for extra leverage — the winch.

Russ always picks a safe escape route. Even a properly cut tree poses danger: A freed trunk could kick out sharply, flattening the sawyer with a mulelike blow. Russ takes no chances. He clears a path in a direction opposite that of the tree.

THREE CUTS DECIDE THE COURSE

Three cuts fell a tree. The first one, the horizontal cut, decides more than the others where the tree falls.

Russ rips horizontally into the tree about 10" above the ground. His cut, like the cross hair on a telescopic sight, perfectly intersects the intended path down which the tree will fall. He saws halfway through the trunk before backing the bar out.

Started a foot above the first cut, the second chews a 45°-angle route down through the wood until it meets the initial kerf. Russ steps back to eye the wedge formed by the two cuts, then kicks it free. Supported only by half the thickness of its original trunk, the walnut still refuses to totter.

Russ delivers the felling blow with a back cut into the tree opposite the freshly sawn wedge. He makes the horizontal cut even with the lower cut of the notch. Starting the saw into the wood, he shouts: "Don't ever cut all the way through! Leave a hinge about 1" thick to guide the tree down."

The saw's laboring buzz eases as Russ withdraws it from the trunk. Shutting off the engine, Russ carries the saw down his escape path. Creaks and cracklings warn of the tree's fall.

"Timber!" Crash. Wha-Thump! The trunk smacks the ground. Right on target.

BUCKING TO BEAT STRESS

The walnut now lies in its rubble. Russ surveys his trophy. With a tape, he measures the trunk while helpers limb the top branches. "I prefer to buck [crosscut] timber into 8' lengths where I can," he says. "Because I like to make maximum use of the figure, I base where I cut the lengths on the most desirable features I see in the log."

The main crotch, where the tree divides, for instance. "Immediately below the crotch is where I find the fanciest flame patterns, often stretching down from it 3' or more," Russ points out. "So, I measure down from the crotch for bucking."

Russ also does the bucking with overcuts and undercuts. Novices discover the wisdom after pinched blades and kickbacks. Russ explains: "The trunk is under two kinds of stress — compression and tension — due to how it contacts the ground and the support or nonsupport given by large limbs. So, kerfs either close quickly or jump open."

Studying the trunk, Russ imagines what the wood will do under the bite of his saw. If to him the trunk looks like it will close up, he makes an overcut first, about a third of the way through. He relieves the tension with an undercut the rest of the way.

Russ inserts occasional support under the trunk. "Chunks of limb, stuck in openings between the trunk and the ground, keep the trunk from binding the blade as you're bucking," he advises. "They'll also keep your chain out of the dirt where it dulls fast."

HOME TO THE MILL

With his own large band-saw mill next to his shop, and a lightweight, portable chain-saw mill, Russ saws lumber practically wherever he chooses. However, he prefers milling with the band saw due to its narrow kerf, and usually hauls his wood home. Russ says the chain-saw-mill is a lot more work.

From felling timber to milling it, do-it-yourself lumber creates tired muscles. But Russ prefers his tired muscles, knowing they represent stock that won't be run-of-the-mill. He's an old-fashioned, start-from-scratch, do-it-all craftsman, and wouldn't change anything.

Written by Peter J. Stephano with David Donnelly
Photographs: David Donnelly

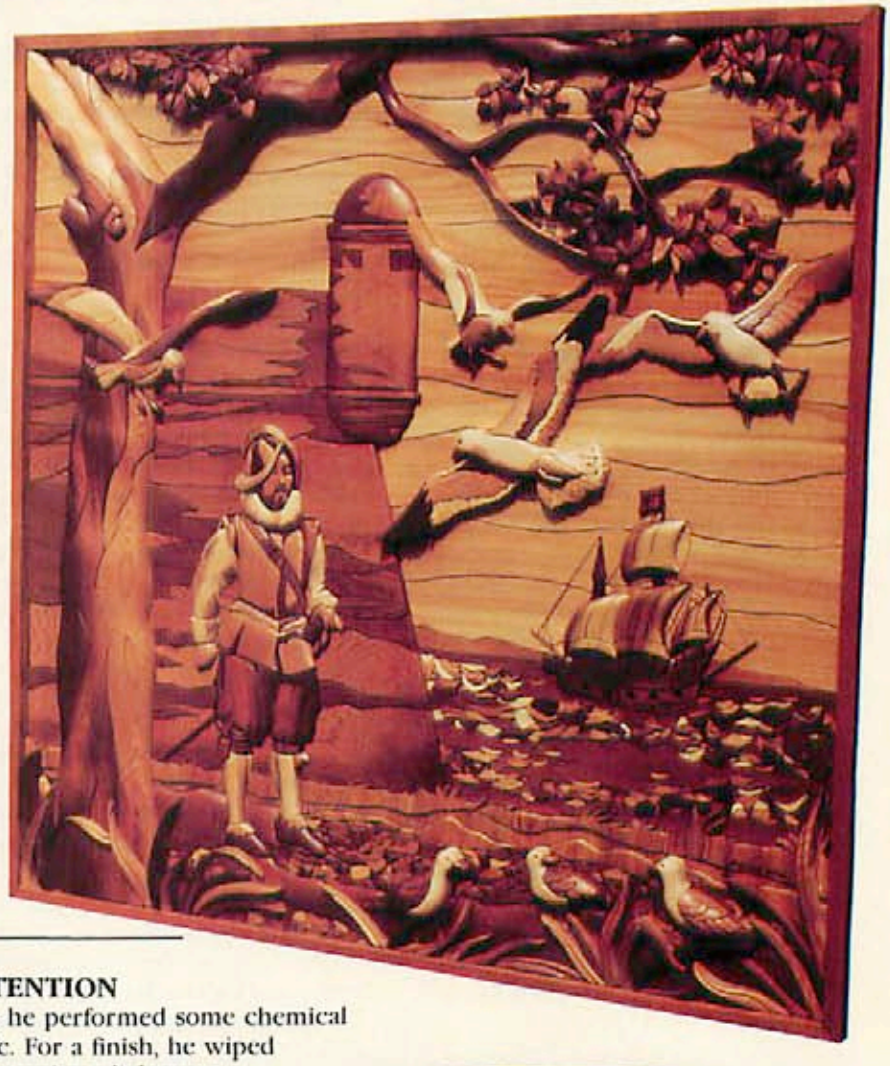
An angled, second cut meets the first and forms a wedge that must be kicked free.

A backcut fells the tree as a winch provides a powerful pull opposite lean.

Russ bucks the log into 8' lengths, depending on what features he finds.

READERS, IT'S YOUR TURN! PROJECT

Whether it's straight stock or stubborn stumpwood, you continually show off your creative craftsmanship.



FLORIDA HISTORY IN CEDAR

Judy Gale Roberts, 30
St. Augustine, Fla.
Woodworker

When Judy and her father developed their style of woodworking from scrap lumber, they didn't realize they were actually "reinventing" an early craft. In the 15th-century, Italians called it *intarsia*, meaning "a carved mural." Judy, working alone now, calls it "painting with wood."

For the 3x3' "Ponce de Leon," she first traced a picture. Then, using carbon paper, she transferred the picture, in parts, to wood. "The figure of Ponce de Leon has 97 pieces, all red cedar," she tells us. Judy chose western red cedar because it offers so much natural color variety.

Each piece was cut with a band saw. She next shaped the pieces with an inflatable drum sander and plenty of hand sanding. With the parts of the three-dimensional jigsaw puzzle ready, she assembled and glued them to ¼"-thick, luan plywood. For a finish, Judy sprayed on multiple coats of clear varnish.

Judy, no matter what the Italians did, we're impressed with your work.

A COMPOTE RECEIVES MEDICAL ATTENTION

Norris D. Bunn, 54
Ocean City, N.J.
M.D., general surgeon

In Norris' waiting room, patients browse through woodworks, not old magazines. His quilted maple compote represents only a part of what they see.

Norris formed his stemmed vessel by gluing up three separate pieces: a partially turned pedestal, a partially turned bowl, and a rough-shaped bowl lip. He made the lip from a circle of 2"-thick maple, cut on a band saw at a 20° angle.

After gluing the pieces together, completing the turning, and sanding the 10"-high, 8"-diameter compote, he performed some chemical magic. For a finish, he wiped on potassium dichromate, which reacted with the tannic acid in the wood. "It produces tans and browns in maple, but you never know exactly what it will look like. Tannic acid goes lighter or darker in different areas," he says.

His unique projects sell easily, except to window shoppers passing by. "People will see my work in the window and come in. When they realize they're in a surgeon's office, they back right out the door," Norris chuckles.

SHOWCASE

BASED ON A STUMP

Timothy Fisher, 35
Craftsbury Common, Vt.
Furniture designer, sculptor, writer, maple syrup maker

Stumps, to some people, would be leftovers. Timothy, however, based his sculpted table on them.

Two 19"-tall stumps of Tasmanian blackwood, a native wood he picked up in New Zealand, pair up as his coffee table's base. Timothy used a chain saw to rough-out the shapes, a gouge and mallet to refine them, and a grinder to remove marks. Cabinet scrapers finely smoothed the surface for his glistening, hand-rubbed oil finish.

Timothy edge-joined 1"-thick rimu, another New Zealand wood, for the 27x39" oval top. He screwed each base for the top to a recessed, metal, mending plate attached to the underside to allow for fast and easy table disassembly.

"Finally, after hauling all that wood around for years," he says, "I've got more than just a souvenir of New Zealand!"

A PLAY PUT TO WOOD

Allan L. Shriver, 29
McMinnville, Oreg.
Artist, woodcarver

Once upon a time, as the story goes, there was a barber named Sweeny Todd whose barber's chair was no ordinary one. Beneath it was a trap door through which he lowered his more "select" patrons to aid his wife's occupation — making meat pies! After seeing the play "Sweeny Todd" on stage, Allan enshrined his version of Mrs. Todd in maple. Fittingly, he calls his somewhat unique carving of the barber's wife, "Cook Gone Mad."

A maple stump, from the ranch where Allan lives, provided the stock for the 21" high, 11" diameter cook. Allan first quartered the stump wood, removed the pith, then closely examined each piece to find the one with the greatest color variation.

Allan works without patterns. His hand-powered carving tools followed his artist's eye to shape the hard, close-grained wood. "All the fun would be gone if I drew a pattern first," he says. "I like to see the piece evolve as I do it." After Mrs. Todd fully "evolved," Allan rubbed her down with beeswax.

To submit your projects...

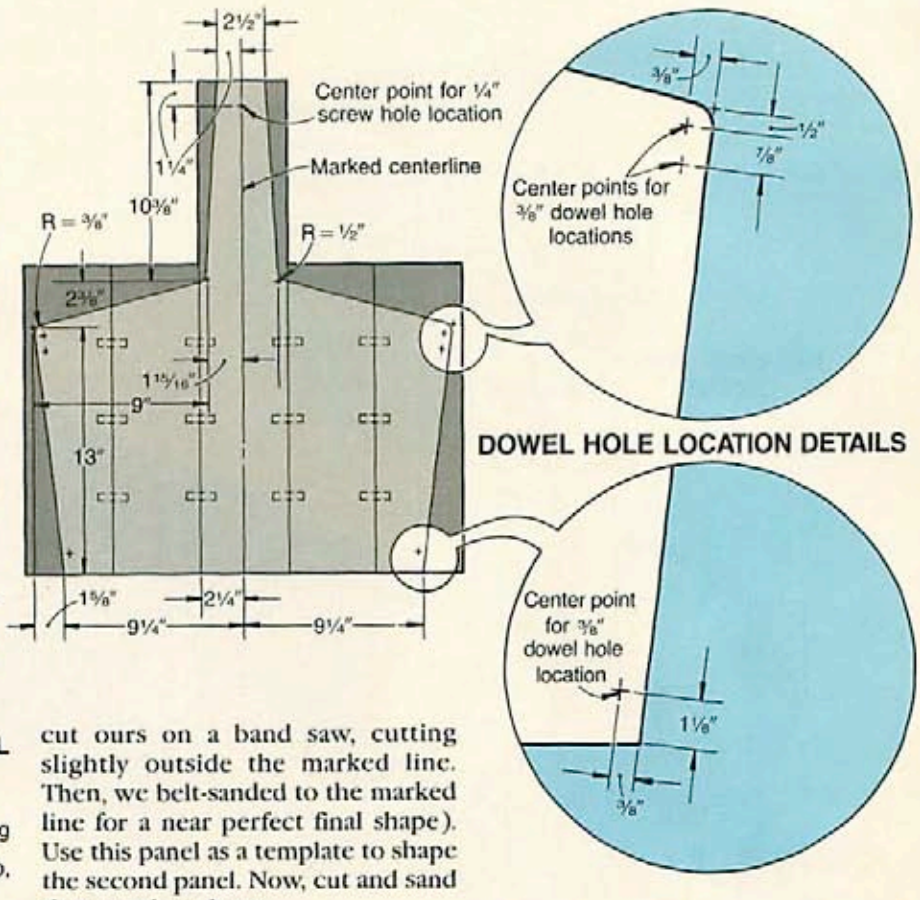
Send a 35-mm color slide *only* (no prints) with the project as the focal point and a simple background — no people. Include a capsule description — materials, joinery, finish, and dimensions, for example. *WOOD* will pay $25 for published projects. Slides cannot be returned unless you enclose a self-addressed, stamped envelope.

Project Showcase
Better Homes and Gardens®
***WOOD* Magazine**
Locust at 17th
Des Moines, IA 50336

EDITORS' CHOICE

QUALITY-CRAFTED PENDULUM CRADLE

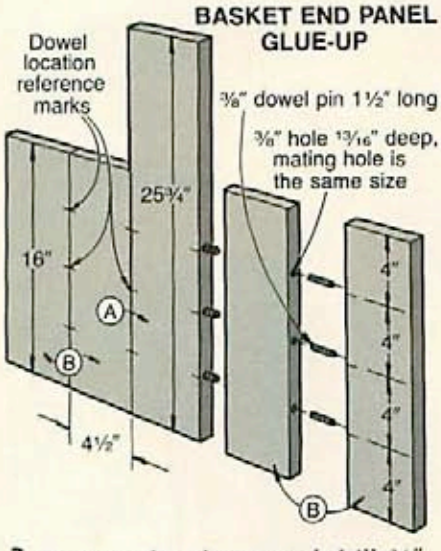
Here's a cradle that's sure to be passed on from generation to generation. Made of durable ash, the cradle features a simple rocking mechanism that offers a soothing solution to the cries of restless babies. What better way to express your love and pride in honor of the newborn?



LAMINATING AND SHAPING THE BASKET END PANELS

1 To make the basket ends, cut two A's and eight B's to the sizes listed in the Bill of Materials on page 61.

2 Dry-clamp each basket end panel together, with the bottom edges of all the parts flush. Next, mark the dowel locations where dimensioned on the drawing *below*.



3 Remove the clamps and drill ⅜" holes ¹³⁄₁₆" deep where marked (we used a doweling jig). Glue, dowel, and clamp the pieces together for each end panel. Once clamped, check them for flatness with a straightedge. If necessary, loosen the clamps and flatten against the pipes or bars of the clamps.

4 Mark a centerline on one of the end panels where shown on the Basket End Panel Shape Drawing *above right*. Then, lay out the panel's shape as shown in the same drawing. Cut and sand the end panel to shape. (We cut ours on a band saw, cutting slightly outside the marked line. Then, we belt-sanded to the marked line for a near perfect final shape). Use this panel as a template to shape the second panel. Now, cut and sand that panel to shape.

5 Lay out and mark the centerpoints for the ⅜" dowel holes and the ¼" screw hole on one of the basket end panels using the dimensions on the drawing *above*. Using double-faced tape, tape the two ends together, face to face, with the edges flush. Drill the ¼" and ⅜" holes through both end panels at the marked centerpoints, backing the panels with scrap wood to prevent chip-out. Separate the ends, and countersink the ¼" holes on the *inside* face of each end panel (see the Rocking-Joint Detail on the next page). Now, drill a ⅜" hole ¼" deep centered over the ¼" hole on the *outside* face of each end to accept the ¼" T-nut.

NOW FOR THE BASKET SIDES

1 Cut the upper and lower rails (C) to size. Using the Rail Details on the next page for reference, rout the ¼" and ⅜" round-overs along the edges of each rail where shown.

2 Mount a ¼" dado set to your table saw, and cut a ¼" groove ¼" deep centered along the *bottom edge* of the *top* rails and the *top edge* of the *bottom* rails. Now, tilt the blade 8° from center, and cut a ¼" groove ¼" deep in each bottom rail where shown in the Rail Details.

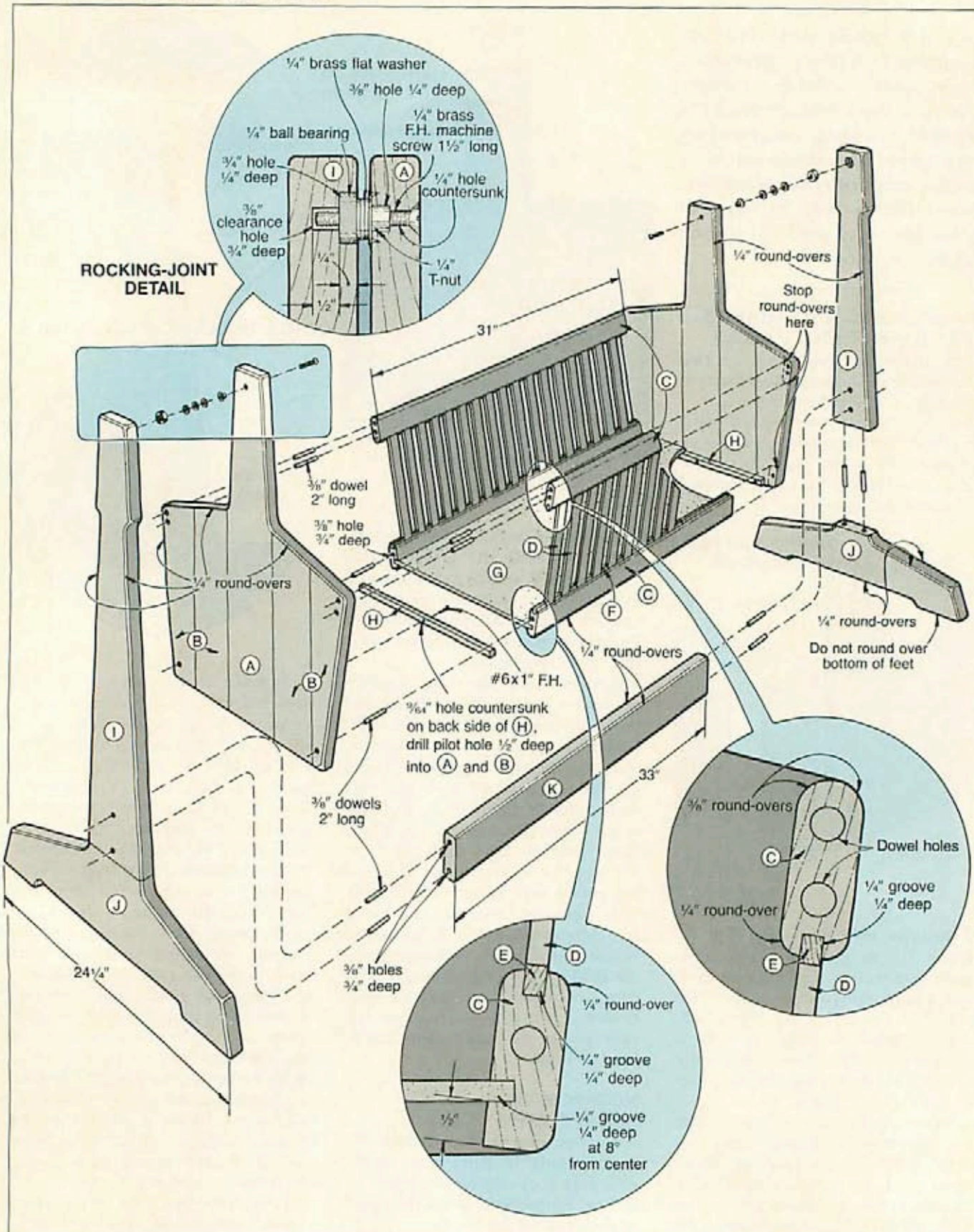
3 To make the slats (D), cut several ¾"-thick boards 10" in length. Now, rip 34 — ¼"-thick strips from the edges of the boards to obtain ¼x¾"-wide slats. (When ripping the slats, we would cut three or four slats on the band saw, stop and joint the edge being cut, and then cut three or four more. You can also cut them on a table saw and eliminate the jointing.) Sand the slats smooth.

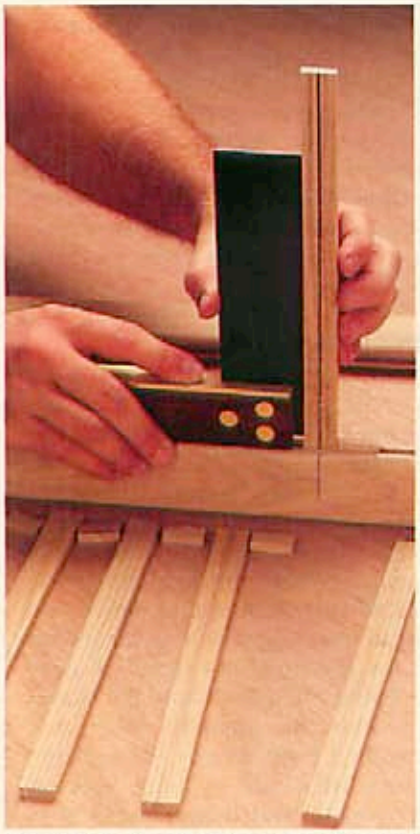
4 To form the spacers (E, F), start by resawing four strips ¼x⅜x24" long from thicker stock. Set a stop and cut 8 spacers (E) 2" long. Now, cut 64 of the 1" spacers (F).

5 Measure and mark the center (between the two ends) of each rail. Then, mark a centerline down one

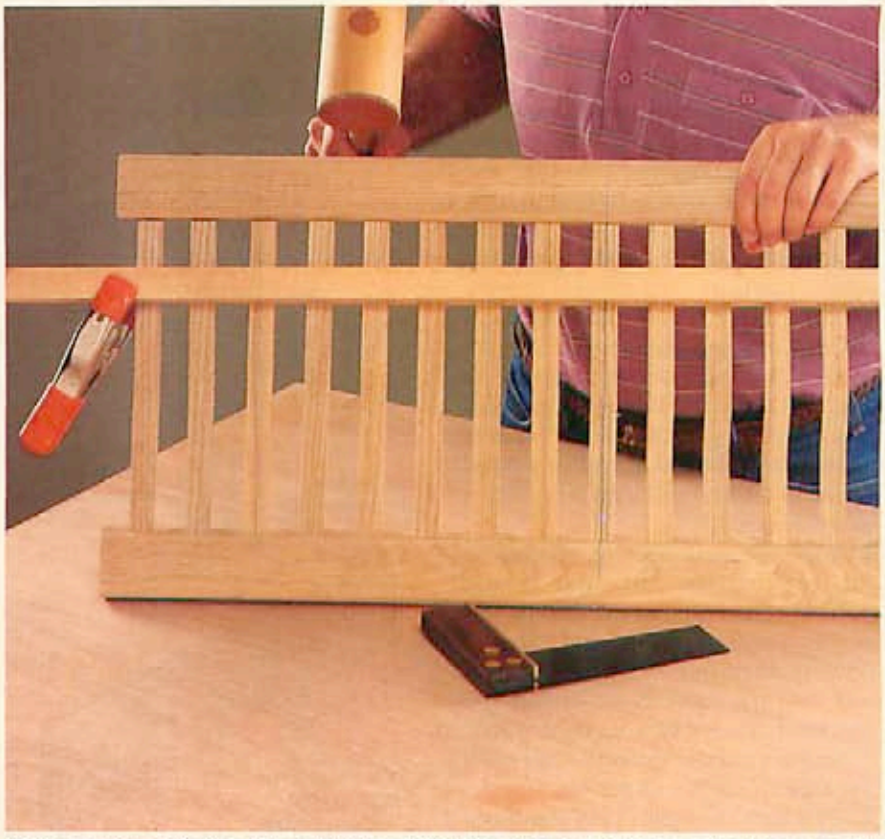
Continued

PENDULUM CRADLE





Center and square the middle slat with the bottom rail.



Align the top rail with the marked middle slat, and then fit the rest of the ash slats into the groove in the top rail.

Bill of Materials

Part	Finished Size*			Material	Qty.
	T	W	L		
A	¾"	4½"	25¾"	white ash	2
B	¾"	4½"	16"	white ash	8
C	¾"	2"	31"	white ash	4
D	¼"	¾"	10"	white ash	34
E*	¼"	⅜"	1⅛"	white ash	8
F	¼"	⅜"	1"	white ash	64
G	¼"	17⅝"	31"	hardboard	1
H	⅜"	⅜"	17"	white ash	2
I	1 1/16"	4¼"	30½"	white ash	2
J	1 1/16"	5¼"	24¼"	white ash	2
K	1 1/16"	3¼"	33"	white ash	1

*Part marked with an * is cut larger initially, and then trimmed to finished size. Please read the instructions before cutting.

Supplies: ⅜" dowel pins 1½" long, double-faced tape, ⅜" oak dowel stock, 2 — ¼" brass flathead machine screws 1½" long, 2 — ¼" T-nuts, ¼" brass flat washers, #6x1" flathead wood screws, masking tape, polyurethane

face of two of the slats. As shown in the photo *above left*, glue and position one of the marked slats in the groove, aligning the centerline mark with the centerline on the bottom rail. Working from the center to the ends, glue the slats and spacers in position, checking that each slat aligns square with the rail. Save the long spacers for the ends of the groove, and trim them to length after they are installed. Repeat this process with the second bottom rail.

6 Clamp a scrap strip on each side of the slats to align them as shown in the photo *above*. Now, run a bead of glue along the groove in each top rail. Center the top rail on the center slat, and tap it onto the ends of the slats as shown in the photo. Next, flip the assembly over to keep the glue in the groove from running down the slats. Again, starting at the center, glue the spacers in position, and trim the end spacers flush. Repeat this procedure for the second basket side.

ASSEMBLING THE BASKET

1 Cut the hardboard basket bottom (G) and the two cleats (H) to size.

2 Run a bead of glue in the ¼" groove in each bottom rail. Insert the basket bottom between the two bottom rails. Dry-clamp the rails in position between the basket end panels, centering the rails over the ⅜" dowel holes in the panels. Make sure the rails are flush with the outside edge of the panels. (We used a bar clamp at each corner to hold the rails firmly in position.)

3 Using the previously drilled dowel holes as guides, drill ⅜" holes ¾" deep into the end of each rail. (To do this, we first centered a brad-point bit inside the hole, turned the drill on, and then drilled into the rails. If you start the drill and then try to insert and align the spinning bit in the guide hole, it tends to drill the hole oversize and off-center.) Later, after the glue holding the hardboard bottom in position has dried, remove the clamps.

Continued

PENDULUM CRADLE

4 Mark the routing start and stop locations on the end panels, using the Exploded-View Drawing on page 60 as a guide. Repeat this process with the other end panel. Rout a ¼" round-over completely around the *outside* face of each end panel. Then, rout a ¼" round-over on the *inside* face of each panel, *stopping* where marked.

5 Cut twelve ⅜x2" dowels from oak dowel stock. Form a glue groove in all but the end (which is exposed) of each dowel to prevent forcing the glue from the dowel hole. (We held the dowel in a hand screw and formed the groove with a sharp chisel.)

6 Apply a small amount of glue to the ends of the rails and in the dowel holes. Position the end panels against the rails. Glue and tap the dowels through the basket ends and into the rails. Now, clamp the doweled assembly together. Later, trim and sand the dowels flush with the face of each end panel.

7 To attach the cleats (H), stand the basket on end. Drill and countersink holes to the sizes stated on the Exploded-View Drawing, and glue and screw the cleats in position.

8 Sand the basket assembly smooth.

BASKET SUPPORT ASSEMBLY

1 Using 1 1/16" stock, cut the vertical parts (I) and the bases (J) to the sizes listed in the Bill of Materials.

2 Using the drawing *above right* as a guide, mark the location of all the holes shown. Then, drill each hole to the size and depth specified. Now, glue, dowel, and clamp each upright together.

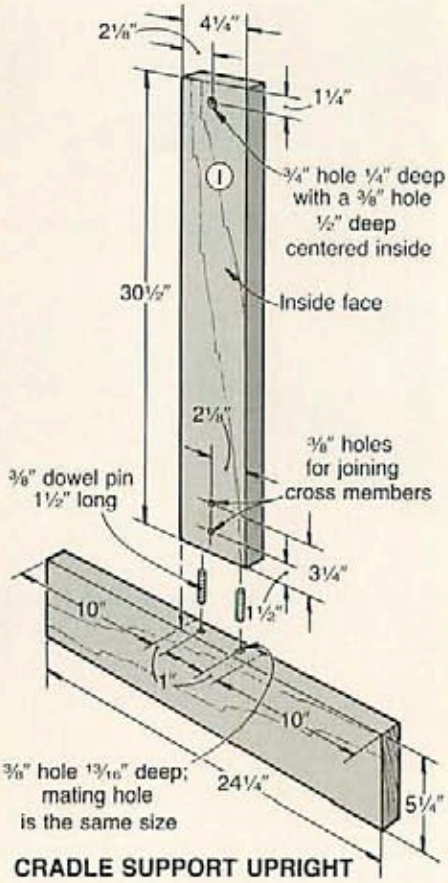
3 Using the drawing at *right* as a guide, lay out the shape of one of the uprights. Cut and sand the upright to shape. Now, use it as a template to make an identical upright.

4 Rout a ¼" round-over on all edges of each upright, *except* on the bottom edges of the feet where shown on the Exploded-View Drawing.

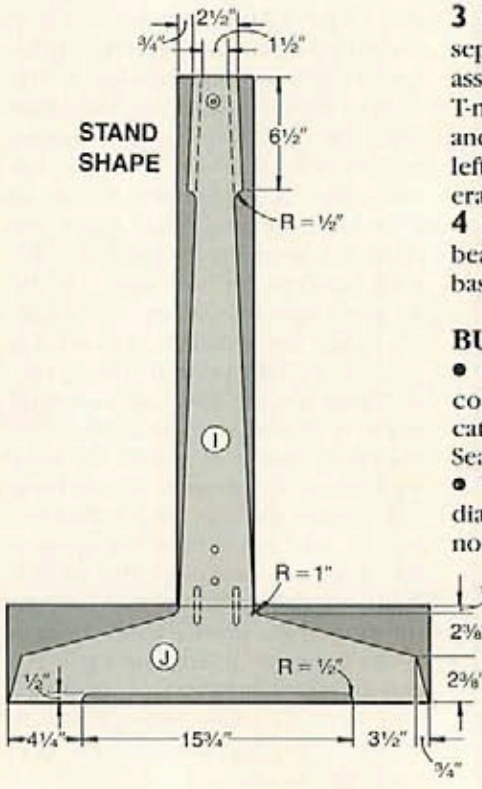
5 Cut the cross member (K) to size. Dry-clamp it in position between the uprights. Using the previously drilled holes as guides, drill a pair of ⅜" holes ⅞" deep centered on each end of the cross member.

6 Remove the clamps, and rout a ¼" round-over along the four edges (but not the ends) of the cross member.

7 Glue, dowel, and clamp the cross member between the uprights, checking for square. Later, sand the dowels flush.



CRADLE SUPPORT UPRIGHT



FINAL ASSEMBLY

1 Tap a ¼" ball bearing into each ¼" hole in each upright. (See the Buying Guide *below* for our source of bearings.) Tap a ¼" T-nut into the ⅜" hole in each basket end panel.

2 To check the fit of the basket in the support assembly, insert a machine screw through the inside face of each basket end panel, and thread it through the T-nut as shown on the Rocking-Joint Detail on page 60. Using a helper to hold the basket between the uprights, continue threading both screws through the T-nuts. Then, add ¼" brass washers for spacers, and thread the screws through the bearings. Thread each screw until the head is flush with the inside face of the basket end.

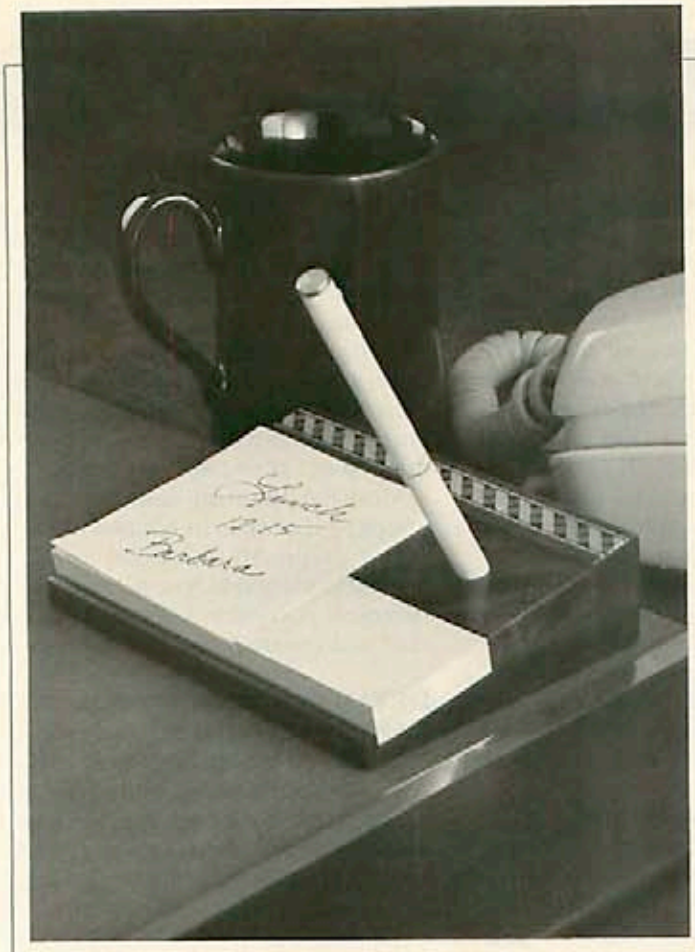
3 Remove the machine screws to separate the basket from the support assembly. Mask off the bearings and T-nuts. Touch-up sand if necessary, and apply the stain and finish (we left ours unstained and applied several coats of polyurethane).

4 Remove the masking from the bearings and T-nuts, and reattach the basket to the stand.

BUYING GUIDE

- **Cradle pad.** 17x31", vinyl-covered polyurethane foam pad, catalog no. 29H30401, $8.99 from Sears. Call a local store.
- **¼" ball bearings (2).** ¾" outside diameter, ¼" inside diameter, stock no. Hoover R4ZZ, $6.86/pair plus $2 shipping. Standard Bearings, P.O. Box 823, Des Moines, IA 50304, 800/554-8123; in Iowa call 800/362-2738.

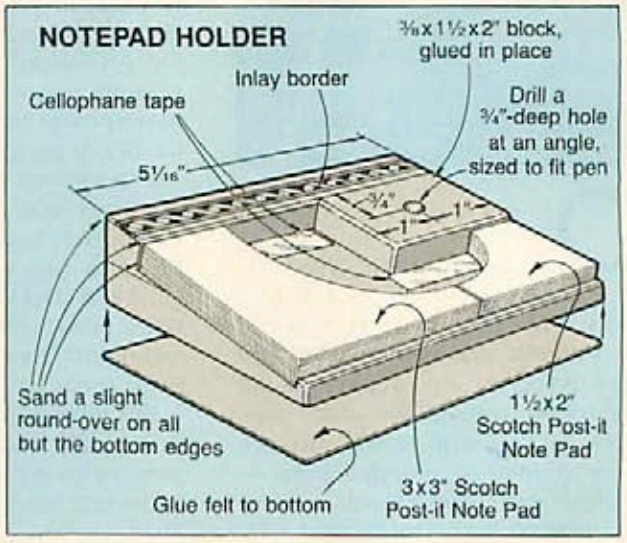
Produced by Marlen Kemmet
Project Design: James R. Downing
Photographs: Bob Calmer
Illustrations: Kim Downing; Bill Zaun



HERE'S A PROJECT YOU'LL LONG REMEMBER

NOTEWORTHY NOTEPAD HOLDERS

Staying organized these days isn't easy. But having this quick-to-build project at the ready will help. We designed it to accept two sizes of Scotch Post-it Note Pads. Now, get ready for lots of requests for this one!

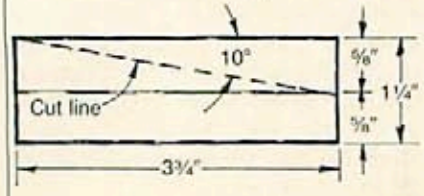


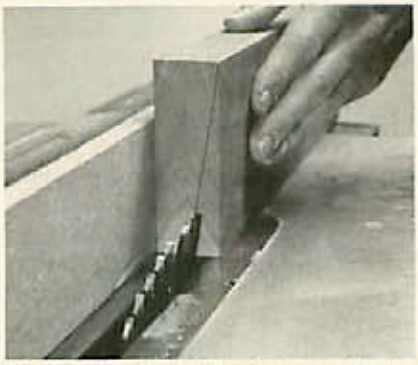
1 Rip and crosscut a piece of ¾" walnut to 4" wide by 22" long. (You need a piece this long for safety. It provides enough material for two holders.) Resaw or plane the piece to a ⅜" thickness.

2 Crosscut the 22"-long piece in half. Glue and clamp the two 11" pieces together face-to-face to form a 1¼"-thick lamination.

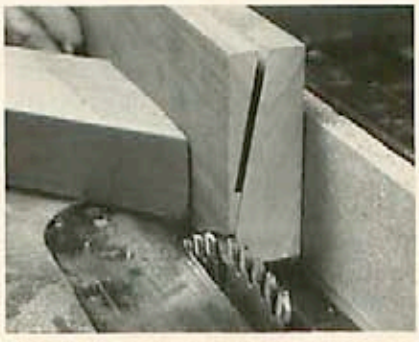
3 After the glue has dried, scrape the excess from one edge (not an end). Position the scraped edge against the table saw fence, and rip the opposite edge for a 3⅞" width. Then, rip the opposite edge for a 3¾" finished width.

4 Crosscut one end of the lamination. Mark an angled-cut line on the squared end of the lamination as shown on the drawing *below*. Raise





Ripping the walnut lamination with the saw blade set at 10° from center



Finishing the angled cut using a feather board for support

the table saw blade about ¾" above the surface of the saw table, and tilt the blade 10° from center as shown in the photo at *left*. Position the fence to align the blade with the angled cut line you just marked on the lamination and make the first cut as shown in the photo. Without moving the fence, make two more cuts, raising the blade about ¾" each pass.

5 Without changing the blade angle, lower the blade below the surface of the saw table, and move the fence to the other side of the blade. (We moved the auxiliary wood fence to the other side of the rip fence at this point.) Raise the blade, reposition the fence, and make two more cuts as shown in the photo at *left* to finish cutting through the walnut. (We used a feather board to support the piece when making the final cuts.)

6 Return the table saw arbor to center, and mount a dado blade the same width as the inlay strip you plan to use (see the Buying Guide

Continued on page 81

ROTARY POWER

Once upon a time, few carvers would even consider laying a rotary power carver to their work. Even today, the controversy still rages: if you use a power carver, are you *really* carving? We won't take sides in this argument, but we know plenty of woodcarvers — amateur and professional — who use these versatile tools. And why not? They make carving faster, less fatiguing, and safer than most traditional hand carving tools. And with hundreds of cutters, burs, rasps, abrasive stones, and other carving attachments to choose from, you can create almost any effect you want with a rotary tool. (You'll find a small sampling of these attachments on page 30.)

Rotary power carvers fall into three basic groups, which we conveniently call *moto-tools, flexible-shaft carvers, and detailing machines.* We asked the manufacturers of each type if we could take one of their models for a test spin. They're shown in the photos on the facing page. Most of these manufacturers offer additional models.

MOTO-TOOLS: GOOD FOR STARTERS

When Dremel decided to miniaturize the industrial die grinder for hobby use, they christened it the Moto-Tool. Today, many folks use this name to describe this entire group of small, inexpensive rotary tools with self-contained motors. So, rather than invent a new generic name for these tools, we'll follow suit (with apologies to Dremel).

Because these tools have a small, light-duty motor housed inside the handpiece, they won't remove lots of wood in a hurry. The handpieces also vibrate and may heat up if used for prolonged periods. For these reasons, many carvers prefer the more-powerful flexible-shaft tools for heavy, prolonged carving.

Even so, we consider these small, relatively low-cost tools the best choice for beginning carvers. You can pick one up for $60 to $100. (Black & Decker and Dremel also sell a broad selection of carving attachments, most of which fit all of these tools.)

But what if you buy one of these little guys and then decide that power carving isn't your cup of tea? You won't have wasted your money. They can do plenty of other jobs around the shop — drilling, sanding, polishing, engraving, sharpening, grinding, and more.

FLEXIBLE-SHAFT CARVERS: A STEP UP

If you're ready to make power carving a *serious* hobby, you'll probably want to consider one of the flexible-shaft tools. Foredom leads the pack with 11 different motor styles (from 1/15 to 1/4 horsepower) and 21 different handpieces to choose from. They also offer the widest range of carving attachments and accessories.

We found the less-powerful flexible-shaft tools (1/15 hp) best suited for light carving and fine detail work. In this category, you can choose from the Black & Decker Rotary Hobby Shop, Dremel 232 and 332 Moto-Flex Tools, Pfingst IMP, and the Foredom F series. (Dremel also offers flexible shaft attachments with pencil-thin handpieces for their Moto-Tools).

The 1/10 to 1/8 hp units (Foredom, MicroLux, Pfingst, Carve-Ease) make the best all-around carving tools. With them, you can do fine detail work as well as fairly heavy stock removal. They also accept the widest range of carving attachments. And, if you're into sculpting lifesize figures, such as carousel horses or cigar-store indians, better go with one of the 1/4-hp machines (the Foredom model H or the Black Knight).

Most flexible-shaft units use foot-operated rheostats to control motor speed (typically 0-14,000 rpm.), leaving both hands free for carving. Foredom also offers manually operated dial controls on some models.

DETAILING TOOLS: BIRD CARVERS LOVE 'EM

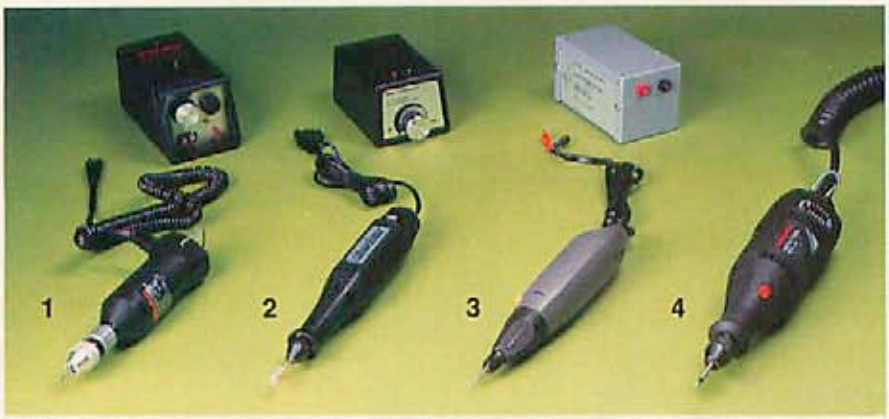
These highly specialized rotary carvers offer the absolute ultimate in fine control. So it's no wonder that carvers of a feather use them to add the final touch of realism to their wildfowl creations.

We tried out the Gesswein Power-Hand II and the NSK Elecster System. The High-Tech Texturing Machine from Craftwoods also fits this category (see manufacturer's list on facing page).

Unlike flexible-shaft carvers, these tools have thin, highly flexible cords, allowing greater handpiece maneuverability. Compared to the other tools we tried, their tiny, high-speed, air-cooled motors (inside the handpiece) vibrate much less. To vary motor speed (up to 35,000 rpm on the NSK and 45,000 rpm on the Gesswein) you turn a dial on the control box, or use the optional foot control.

Flipping a switch on the control box reverses the direction of rotation. Woodcarvers use this feature, along with non-directional ruby or diamond abrasive cutters, to carve with the grain without "fuzzing" the wood. Reversing rotation (counterclockwise) also makes left-handed carving easier. You'll find these tools pricey ($660 for the NSK, $615 for the Gesswein, and $385 for the Hi-Tech).

CARVERS PLUG IN TO A FAST, FUN CARVING TECHNIQUE



MOTO-TOOLS: 1. Black & Decker Precision Detailing Tool Kit no. 9806. Includes Model 9814 variable-speed detailing tool, 15 bits and accessories, plastic case: $103.00. 2. MicroLux High-Speed Drill/Grinder no. 15230. Tool: $29.95; transformer: $29.95. 3. Miniplex M2 Miniaturized Drill no. 713B. Tool: $45.65; transformer no. 721C: $28.95. 4. Dremel Variable-Speed Moto-Tool no. 395. Tool: 92.95. Kit no. 3950 includes tool, 40-pc. accessory assortment, plastic case: $104.95.

FLEXIBLE-SHAFT CARVERS: 1. Carve-Ease no. 09001. ⅛-hp, 14,000-rpm motor, foot pedal: $143.50. 2. Pfingst model CHP. ⅛-hp, 14,000-rpm motor, foot pedal: $140. No. 330 handpiece $45. 3. Black Knight no. 261-000. ¼-hp, 18,000-rpm: $399.95. Uses Foredom foot pedal no. 795010, $25.95. 4. MicroLux no. 50322. 1/10-hp, 20,000-rpm motor, foot pedal, 18 bits and accessories: $109.95. Foredom model RB-35. 1/10 hp, 14,000-rpm motor, foot pedal: $213. Handpiece no. 44B, $39.

DETAILING TOOLS: *Left:* Gesswein Power-Hand II, no. 09A31. Variable-speed motor (10,500-45,000 rpm); 6-foot flexible cord: $615. Variable-speed foot pedal (0-45,000 rpm): $110. *Right:* NSK Electer System. Variable-speed motor (3,000-35,000 rpm); 6-foot flexible cord: $660. Variable-speed foot pedal (0-35,000 rpm): $40.

FOR MORE INFORMATION:

Moto-tools

Black & Decker/DeWalt
626 Hanover Pike
Hampstead, MD 21074

Dremel: Div. of Emerson Electric Co.
4915 21st St.
Racine, WI 53406

MicroLux: Micro-Mark
Box 5112
Clinton, NJ 08809

Miniplex: Divine Brothers Co.
P.O. Box 438
Utica, NY 13503

Flexible-shaft Carvers

Black & Decker/DeWalt
(see above)

Black Knight: Wood Carvers Supply, Inc.
P.O. Box 8928
Norfolk, VA 23503-1366

Carve-Ease: P.C. English Enterprises, Inc.
P.O. Box 380
Thornburg, VA 22565

Dremel (see above)

The Foredom Electric Co.
Route 6
Bethel, CT 06801-0262

MicroLux (see above)

Pfingst & Co., Inc.
P.O. Box 377 Dept WM
South Plainfield, NJ 07080-0377

Detailing Tools

Gesswein: Woodcraft Supply Corp.
41 Atlantic Ave., Box 4000
Woburn, MA 01888

Hi-Tech Texturing Machine: Craftwoods
10921 York Road
Hunt Valley, MD 21030

NSK-America Corporation
101 W. Lions Drive Suite 111
Barrington, IL 60010
Our source for NSK: P.C. English Enterprises (see above)

Produced by Jim Barrett
Photographs: Bob Calmer; Jim Kascoutas

MADE IN AMANA

FURNITURE CRAFTED IN A TIME-HONORED TRADITION

Ehrle Brothers winery, in the village of Homestead, offers you rhubarb, elderberry, dandelion, and other wines. Down the road, in "main" Amana, the Meat Shop and Smokehouse sells your senses with knockwurst, bratwurst, smoked ham, bacon, and *kassler rippchen* (smoked pork chops). Outside, a century-old smoke tower puffs the aroma of smoldering hickory chips.

Native hardwoods, though, provide more than wood smoke in Iowa's Amana Colonies. Generations of woodworkers have turned local ash, cherry, hickory, maple, oak, and walnut into solid, durable furniture. First, for their own use, now for customers from around the nation and the world.

"I think people know that quality comes from the Amanas. The ones that don't know, it won't take them long to find out: a taste of rhubarb wine, double-smoked ham, or a touch of fine furniture."

Furniture-maker Norman Schanz
South Amana, Iowa
(opposite page)

The West Amana carpenter shop once turned out farm wagons and stock gates, as well as utilitarian furniture. Many craftsmen learned their skills there, before starting their own businesses.

Norman Schanz, who traces the woodworking blood in his veins back to his family's German homeland, apprenticed with Dave Krauss. Krauss had learned at the West Amana shop before going on his own. Norman stayed with Dave Krauss 11 years, until he could start his own woodworks, Schanz Furniture. Over time, family skills have resurfaced in the Amanas.

No "Help Wanted" ads

Norman opened his furniture shop in South Amana 18 years ago. He's never advertised for help. "Here, we kind of handpick them," he says, pride swelling his tall, workman's frame.

"Like Carl Unglenk, our lathe man. He worked in the Amana furniture shop in the fifties, then be-

THE AMANA COLONIES Seven Little Villages Shaped By Tradition

In east central Iowa, lie seven small villages known collectively as the Amana Colonies. Their heritage: German.

Thought by many to be Amish, the people of the Amanas instead inherit the beliefs of a religious movement that began in Germany about 1714. Calling themselves *The Community of True Inspiration*, ancestors of Amana villagers came to Iowa in 1855 to enjoy religious freedom. There, on 18,000 acres of wide, green, river valley, they formed an economic communal system in which all members shared in the necessary work. The first cadre built a village they named "Amana." The word, from the Song of Solomon, means "remain faithful." Soon, "The Colonies" grew to 26,000 acres.

In their communal society, members did not own private property or receive wages. Rather, they were housed, fed, educated, and cared for in exchange for work. Community self-sufficiency was revered along with religious beliefs.

Besides the farm and domestic workers in each village, there were blacksmiths, butchers, carpenters, furniture-makers, harness-makers, tinsmiths, and other necessary tradesmen. Their skills were passed down through generations; their products heralded.

For decades, life was good. Then, in 1932, came "The Great Change." Economics, and increasing dissatisfaction with the communal system, forced an abandonment of their lifestyle. Community members elected to form a profit-making, profit-sharing corporation they named *The Amana Society*. Shares were issued, wages were paid, and a board of directors ran the business side of the Amanas. The Amana Church Society served worship and religious education.

To this day, many business people in the Colonies belong to the Amana Society, but membership isn't a requirement to operate. Yet, stockholders and non-stockholders alike, from an appliance factory to meat markets to restaurants, wineries to woolen shops, and furniture makers to basket weavers, remain faithful to a tradition of fine craftsmanship.

Continued

came a butcher in the meat shop. After 20 years, he got bursitis from the cold, and came to me looking for work. Now, he turns by eye from an original piece. He can turn 100 legs and 50 spreaders, and if I held any two up, they'd look identical. He has the knack."

All down the list of 10 employees, there's a tie to old Amana families and skills. For example, Allan Trumpold, a key man at Schanz's, comes from a line of carpenters. His mother has deft fingers for chair-caning. Joanna, Norman's wife, weaves baskets, makes brooms, and canes chairs, too.

Some of Norman's people speak fluent "Colony Deutsch," Amana's version of the German language. Even those who don't, hint of it in their speech. "We're all in the family here," says Norman, "and everyone's treated like family. Nobody has to be told what to do."

The almost-old way of doing things

Simple lines characterize furniture traditional to the Amana Colonies. Fancy stuff had no place in the society's no-frills lifestyle. In the eighties, however, Norman and other furniture makers in the Amanas also build what will sell.

Norman crafts dry sinks, popular for the country look. But, he says, in the Amanas no one used them because there were communal washhouses. There weren't any oak iceboxes, either. In the old days, each village had a icehouse to serve the central dining hall. Yet, everyone who builds furniture in the Amanas makes reproduction iceboxes. Specific style doesn't set Amana-made furniture apart. Craftsmanship does.

"We use the old, traditional construction," says Norman. "Dovetail joints. Framed panels. Mortise and tenon. And our wood is 7/8" thick, finished, not 3/4."

Most old Amana furniture was made from walnut or cherry — cut from the Colonies' land, rough-sawn in the villages, and air-dried. Today it's made in the customers' choice of woods, bought from a supplier already kiln-dried and surfaced. "My surfacer only feeds 12 feet per minute. Theirs does 40," he explains. "Labor costs more now."

Buying wood isn't the only difference between today and 100 years ago. Norman remembers when the first woodworker's white glue was introduced. "When Elmer's first came along, we were still using hot pot glue. 'Oh, my God, the world's coming to an end! What are we going to do?' But, we got used to it, and then Titebond comes along."

For Norman and his workers, craftsmanship provides a link with the past. "The quality is here," he says while pointing to an assembled piece. "We have to keep it up. We frame things the way they were always framed. We do things the way we were taught when young." The old ways often show up in little examples.

"My man Ron Haldy once had a heck of a time building a custom credenza that required 15° angles. He just couldn't figure them. Amana Colonies furniture was usually made square, so he could do a 45°, no trouble. Basically, he was taught the old-time construction."

"We are the factory, lock, stock, and barrel. I'll help you design it, I'll make it, and I'll load it in your car!"

Spraying isn't traditional, either. Yet, that's how Sue Sherman, who schedules the work for Norman's finishing crew, starts the "Super Schanz" finish (for step-by-step details, see page 71). "Sue sprays enough work for a week every Friday — old and new together — so on Monday there's finishing work to do," says Norman. "Spraying saves time, but there's still lots of hand-sanding and steel-wooling."

According to Norman, it's the heritage of craftsmanship that makes furniture from the Amanas an investment. "You take commercially made furniture. Most of it will never be worth more. Amana Colonies furniture will be worth 100 percent more than you paid for it in 10 years. Dave Krauss (of Krauss Furniture) used to tell people: 'If you don't like it in 10 years, I'll buy it back for what you paid for it.' Course, no one in their right mind took him up on it."

Making furniture by the batch

Schanz Furniture sells nearly 250 oldtime-style rockers every year. They're his most popular item. Even at that, the rockers aren't mass-produced production-line fashion, but by the "batch."

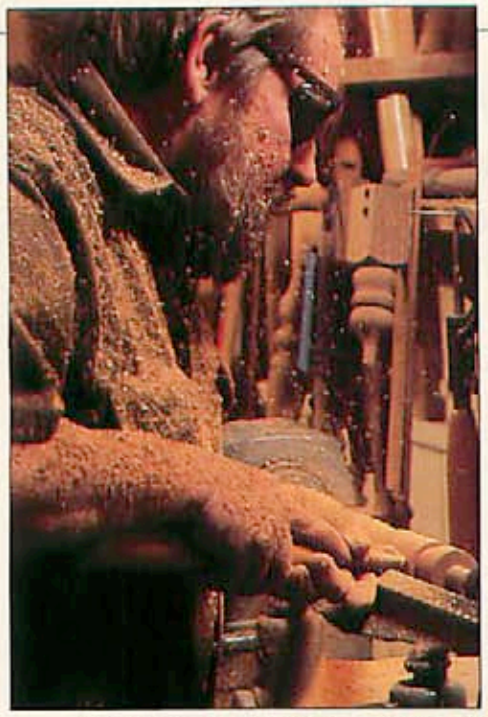
Ron Haldy makes the rockers — 25 to 50 at a time. From start through assembly, he controls the quality of every piece, except for the spindles and spreaders turned by Carl. Ron rips all the stock. Next, he saws out all the rockers, backs, and seats on the band saw. Then, he sands the parts on the stroke sander, drills the holes in the seat for the caning, and assembles. Making them that way, Ron averages five hours per rocker. The craftsman feels satisfaction in seeing his work come together, and Norman likes the pace and the quality.

"Ron can make rockers faster, but we've found out that with more than about 50, efficiency starts to drop. My people do their own quality control," Norman notes.

Salesmanship in bib overalls

Norman firmly believes his furniture sells itself — but talking sure doesn't hurt. "Four hours' talking with a customer can give us 40-60 hours of work," he says. And Norman talks in a flannel work shirt and bib overalls. That's because he

One of the three roll-top desks being built by Allan Trumpold will fill a Colorado order. ▶



Carl Unglenk duplicates turnings by eye. Pick any two at random, and you can't see the difference.

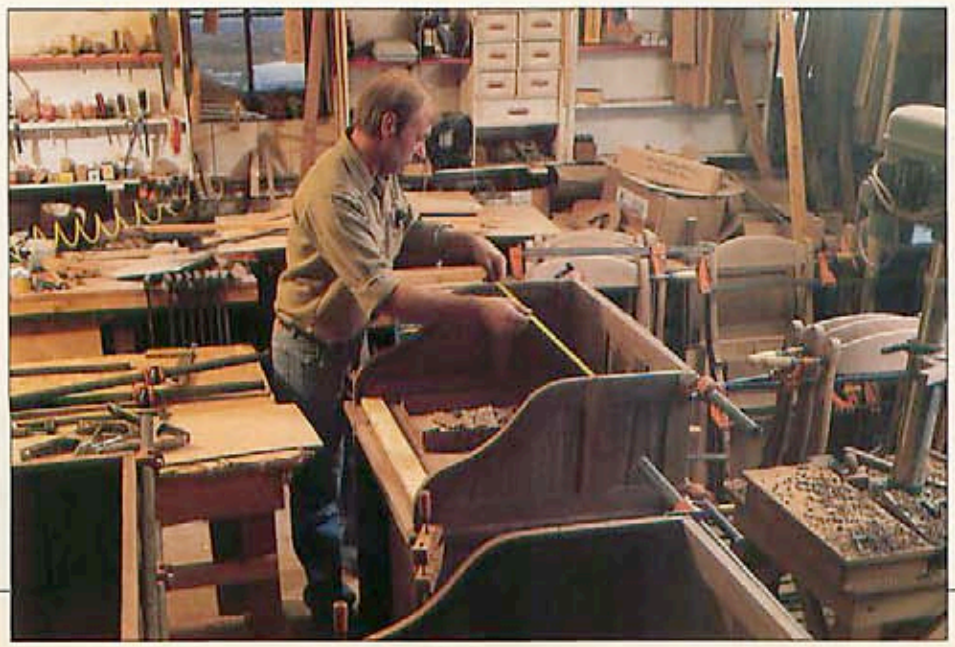
At the stroke sander, Ron Haldy smooths a rocker part. The 6"-wide, 288" belt of 60-grit abrasive sands at a touch of the pad. This is the only sanding done to most parts before the finish goes on.

also believes that customers want to meet the craftsman who builds the furniture, not some paid salesman in a necktie.

"Our furniture is made and sold right here." Norman's arm sweeps the room. "We are the factory, lock, stock, and barrel. I'll help you design it, I'll make it, and I'll load it in your car!"

At Schanz Furniture, custom orders represent about 50 percent of all new furniture sold. That represents lots of talking. "I guarantee the final price to be within three percent of my quote when they get the finished piece eight to 12 months later," he relates. "Too, I say 'if you don't like the piece when it's finished, don't take it.' We'll sell it. We never make white elephants."

His down-to-earth approach in customer relations keeps buyers returning. Yet, customers don't always want to wait for a piece. "You're always better off making only what you need," he advises. "We want to be sure we're making furniture for the customer who wants it instead of for ourselves. But, some people want something NOW. If I have it, they'll buy it."



Anything old is worth restoring

Fifty percent of Norman's total business comes from restoring furniture. He advertises for it, customers bring furniture in, Sue strips it, and Carl (the lathe man) keeps busy between turnings, disassembling it, repairing, and regluing.

"People tend to buy from the same place where they can get furniture repaired," Norm says, tugging at his whiskers. "Restoration and repair builds customer trust."

Complete restoration may cost up to 80 percent of new furniture price. At Schanz's, there's little that can't be repaired: basket-case, pressed-back oak chairs, rockers held together with scrap metal and rusty bolts, old disheveled wicker. "Anything old is worth restoring," he emphasizes. "Like wood and how it grows, each old piece of furniture has a story in it that's important to the owner. Good furniture is always good furniture."

Produced and written by Peter J. Stephano
Photographs: Perry Struse

THE TRADITIONAL AMANA FINISH

NORM SCHANZ SHARES HIS TIME-PROVEN TECHNIQUES

Over the years, furniture made in the Amana Colonies earned a reputation for quality and fine craftsmanship. A part of that good name undoubtedly comes from its durable, yet beautiful finish. That craftsmanship tradition, started during the colonies' early days over a century ago, continues to this day. (See "Made in Amana — Furniture Crafted in a Time-Honored Tradition," pgs. 66 - 69).

What goes into an Amana Colonies finish? We've been curious for some time, so recently we paid a visit to the Schanz Furniture and Gift Shop at South Amana, Iowa. This gave us a great opportunity to talk about furniture finishing with owner Norman Schanz, and observe his finishing crew as they applied the "Schanz" version of the prized finish to some popular Amana offerings made in his shop.

Although techniques and products have changed over the years, Norman proudly emphasizes that he still uses many of the old traditional Amana Colonies finishing techniques in his shop.

Another piece of Amana furniture gets the hand-sanded, hand-rubbed treatment from Sue Sherman.

Watch for this continuing series of articles on fine wood finishing systems in future issues. Previous articles are: *Polymerized tung oil*, December, 1986, pgs. 52-53; and *Lacquer*, August, 1987, pgs. 66-69.

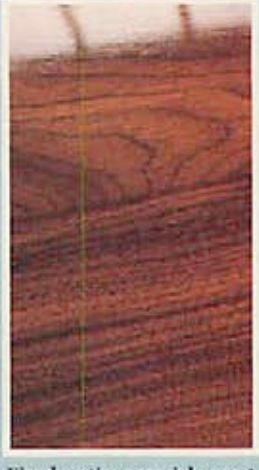
The Super-Schanz four-coat, hand-rubbed varnish system, as applied today, may sound complicated. But break it down into steps and the complexity disappears. Norman says that anyone with a little patience can get the same good results he and his employees do. In fact, he feels so positive about this that he offers his custom-blended sealer and varnishes to do-it-yourselfers and provides the necessary step-by-step instructions. (See our Buying Guide at the end of this article for details.)

No glass-slick sanding in this shop

Here's the very first departure from typical woodworking procedures we spotted in the Schanz shop — no elaborate or extra-smooth sanding. In preparing wood for finishing, most woodworkers sand with progressively finer and finer sandpaper to end up with an ultra-smooth surface. Not here! At Schanz's, each piece gets sanded once, usually on the stroke sander or one of the drum sanders. And, it's done with 60-grit paper!

Walnut, sanded with 60-grit paper, and ready for finishing.

First coat of varnish sanding sealer, dry and ready for sanding.



Final satin varnish coat, ready for final sanding and rubbing.

Four-coat varnish finish pictured at right fares well in appearance comparison with a lacquer finish pictured at left.

"We don't waste time sanding to a glass-slick surface before applying the finish — the results won't be any better," Schanz admonishes. "Leaving the surface this coarse gives the sealer a better bite so it adheres better to the wood's surface." Actually, we noted this sanding produces a surface compable to what you'd get hand-sanding with 100-grit sandpaper.

Building the finish, coat by coat

Schanz's four-coat, hand-rubbed varnish system consists of one coat of varnish sanding sealer, two coats of gloss varnish, and a final coat — usually a satin varnish.

"We spray our special varnish-based sanding sealer for the first coat," Norman explains. "It has equal parts of varnish and sanding sealer. It seals and builds film at the same time. We apply it with no thinning, as heavy as possible, almost to the point of runoff."

This multicoat system requires sanding after applying each coat. "We sand just enough to level the surface for the next coat," says Norman. "Of course, you have to remove dirt bumps and take care of runs, if there are any. But otherwise, don't sand away any more of the coat than necessary. You want to build up a level film." He also advises removing the sanding dust.

You only get a hand-rubbed look by rubbing

Schanz applies a top coat of satin varnish that gives a reduced sheen. Then comes rubbing.

"We always rub the final coat," Schanz says. "A lot of products advertise that they produce a 'hand-rubbed' look without rubbing, but I've never seen one that looks as good as when you do rub it."

To create that "rubbed look" the Schanz crew rubs the final coat with 0000-grade steel wool. On large surfaces where straight-line air sanders can be used, they'll rub with a nylon pad called Bear-Tex.

"You have to rub until you've dulled the surface uniformly," he advises. "Sometimes you think you're damaging the finish, but you won't if you rub with the wood grain and apply uniform pressure."

Rubbing produces a gray cast on the finish surface. To remove this, the finishers wipe the surface with a rubbing oil similar to lemon oil.

"We used to brush all of our finishes," says Schanz. "But to stay competitive, we've had to adapt new techniques. So we bought the sprayer. It not only saves us time but also yields a better finish."

Schanz uses an airless-spray system. The operator, Sue Sherman, follows a set pattern or sequence when spraying each piece of furniture and uses a turntable and spray racks when possible. Spraying a rocking chair, for example, takes her about 40 seconds.

"In our shop, the spray operator also sands," quips Norman, "so she gets to see the job she's doing. But, Sue does a good job," he adds.

You can brush-apply the finish, and Norman recommends it for small projects. He says to just load the brush often, flow on the varnish, and try to get the coat as uniform as possible.

Schanz batches all finishing operations — spraying every Friday. Each piece sprayed that day gets the same application. For example, on one Friday, Sue sprays sealer. These items dry over the weekend and will be sanded the following week. The following Friday, the next coat will be applied. This sequence continues through the cycle, then starts over again.

BUYING GUIDE

- **Schanz sanding sealer, gloss varnish, satin varnish.** Pint cans, $5.50 each. Schanz Furniture & Gift Shop, Highway 6, South Amana, IA 52334. 319/622-3529.
- **Norton Bear-Tex.** Nonwoven nylon impregnated with aluminum oxide or silicon carbide. Box of 10 — 6x9" sheets or 5 — 4"x30' rolls, 3 grit sizes. Norton Company, Abrasives Marketing Group, Worcester, MA 01606.

12 EASY STEPS TO A FINE AMANA FINISH

To reproduce the same tough, protective finish on your wood projects, follow these simple steps:

1. Sand new furniture smooth. Strip old furniture to bare wood and sand.

2. If you stain, brush on, then remove excess, wiping with the grain. Let stain dry at least 24 hours.

3. Apply a uniform coat of varnish sanding sealer, and let dry 24 hours.

4. Sand the sealer with 180-grit sandpaper to remove any runs or dust particles and to level the sealer. Sand only enough to smooth the surface. Remove sanding dust with a tack cloth.

5. Apply the first coat of gloss varnish, and let dry 24 hours.

6. Sand the gloss coat with 180-grit sandpaper to level the film's surface. Remove the sanding dust.

7. Apply the second coat of gloss varnish, and let dry at least 24 hours.

8. Sand the second gloss coat lightly with 220-grit sandpaper. Remove all sanding dust.

9. Apply the satin varnish topcoat. Dry thoroughly, preferably for several days.

10. Sand the satin topcoat lightly with 320-grit sandpaper. Remove all sanding dust.

11. Rub surface with 0000-grade steel wool until a dull-looking sheen or gray cast appears. Apply uniform pressure, rub with the grain. You can use Bear-Tex or similar rubbing pad in place of the steel wool.

12. Clean the surface with lemon oil. Periodically reapply lemon oil to renew the finish. Sit back and enjoy your work.

Produced by: Charles E. Sommers
Photographs: Perry Struse

How to be a HARDWOOD SUPERSLEUTH

When you can't positively identify a hardwood, do like the pros — take a closer look.

We see the same question over and over in reader letters: *"The wood profile in every issue sure helps to identify standing trees. But, isn't there a way to tell what the wood might be when its down and dry or cutup in a firewood pile?"*

It's probably a crying shame how much potentially good hardwood for carving, turning, and even boards has been passed by because no one knew it was worth the bother. And, there isn't a pocket-sized, field identification guide book we know about that helps you name downed logs and chunks.

Field guides seem to be published for summertime hikers. They rely on illustrations or photographs of leaves, twigs, and standing trees. That's all fine and dandy, but if all you have to look at is a chunk of wood you think *might* make a great bowl, no way! So, we went to the pros for help.

SEARCH FOR CLUES

Botanist Donna Christensen solves identity mysteries every day in the wood anatomy research section of the U.S. Forest Service's Forest Products Laboratory in Madison, Wisconsin. According to her, you can name an anonymous hardwood through a number of tests (see "TESTS FOR IDENTIFYING DOWNED TIMBER," page 91). "If one test doesn't give you a clue, apply another until you find the solution," she advises.

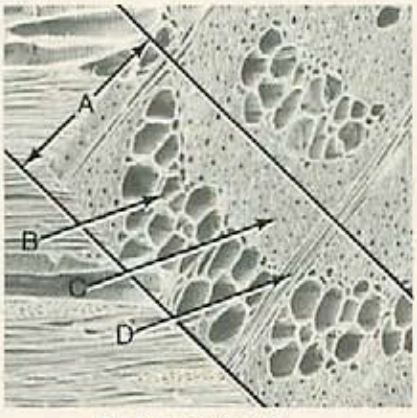
Botanists and dendrologists (those who study trees) usually can identify a wood quickly. When they're still stumped, however, they put their eye to a microscope to check a wood sample for telltale structure. We discovered that even amateur wood detectives can tell, at least generally (such as *hickory* or *oak*), what wood they have by looking at it the same way — close up — with help of a hand lens.

HOW TO RECOGNIZE A WOOD BY ITS PARTS

Hardwood species have "fingerprints." Their fingerprints are the differently structured parts and appearance of the annual growth rings (see photograph, *below*).

In some hardwoods, it doesn't take magnification to see the annual growth rings in the end grain. However, it's the size of the pores or cellular structures called *vessels* and where they fall in both the *earlywood* and the *latewood* that help classify and identify hardwoods with a hand lens. (See photographs and species classification, *opposite*.)

Ring-porous species display a clear distinction in size between pores in the earlywood, developed during the first part of the growing season, and those in the latewood, produced when trees grow slowly. *Diffuse-porous* species on the other hand, have pores of approximately the same size distributed throughout the ring. Scientists call wood showing pores of various sizes throughout the growth ring *semi-ring porous*.



End grain (elm)

A Growth ring
B Earlywood pores
C Latewood pores
D Rays

Rays can aid you in identifying hardwoods, too. Most often you'll see them as fine lines crosshatching the wood at regularly spaced intervals perpendicular to the growth rings. In the oaks, they're bold.

PUT A HAND LENS TO HARDWOOD

To see pores and rays clearly with a hand lens, slice the end grain of your log in the heartwood with a sharp blade. Next, dampen the fresh surface slightly, then focus the lens.

The photos on the opposite page, taken at hand-lens magnification, then nearly doubled in size for added clarity, show what you'll see in 15 common hardwoods. Study the end grain of other species with a hand lens. You'll build knowledge, and a Scotland Yard reputation.

REFERENCES FOR A SUPER SLEUTH

To keep you from barking up the wrong tree, we suggest:

Trees of North America, a Guide to Field Identification, by C. Frank Brockman, 1979, The Golden Press, NY, $7.95 (pocket-size, illustrated, easy-to-use handbook).

The Audubon Society Field Guide to North American Trees, by Elbert L. Little, 1986, Alfred A. Knopf, NY, $13.95 (handbook with photographs, keys to identification, east/west regional editions).

Wood Structure and Identification, by H.A. Core, W.A. Côté, A.C. Day, 1979, Syracuse University Press, Syracuse, NY, $12.95.

Where you can buy a hand lens: Opticians, jewelry stores, and jewelry supply houses sell 10X magnification hand lenses for about $10.

WHAT YOU SEE IS WHAT YOU GET
CLASSIFYING HARDWOODS WITH A HAND LENS

Use the hardwoods shown below as a reference when identifying wood with a hand lens. First, decide what cell structure your wood sample has, then see if it matches any of those illustrated. Remember, you might only be able to name the wood generally, such as *birch*. If you're still not sure of your identification, apply the tests described on page 91. Become familiar with the cell structure of known hardwoods you *have* in the shop and found where you live. A tree guidebook comes in handy, too.

RING-POROUS

American elm

Chestnut

Hackberry

Red oak

White oak

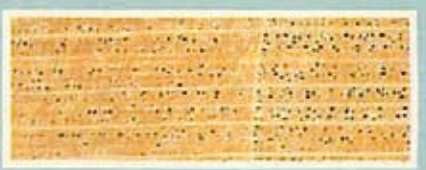
White ash

Other ring-porous woods not shown: Hickory, Redbud, Black ash, Honeylocust, Kentucky coffeetree, Mulberry, Osage orange, Black locust, Sassafras, Slippery elm

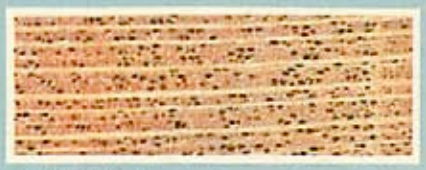
DIFFUSE-POROUS

American holly

American beech



Basswood



Black cherry

Red alder

Sugar maple

Other diffuse-porous woods not shown: Red maple, Buckeye, Pacific madrone, Yellow birch, River birch, American hornbeam, Flowering dogwood, Yellow poplar, Magnolia, Tupelo gum, Eastern hophornbeam, Sourwood, Sycamore, Aspen, Cottonwood, Willow, Myrtle

SEMI-RING POROUS

Black walnut

Butternut

Pecan

Other semi-ring porous woods not shown: Catalpa, Persimmon, Tanoak, Cascara buckthorn

Produced and written by Peter J. Stephano Illustration: Jim Stevenson
Photomicrographs: W.A. Côté, State University of New York, Syracuse; N.C. Brown Center for Ultrastructure Studies

Continued on page 91

FARMERS' SEED COMPANY BIRD FEEDER

Birds love to congregate around real-life country elevators in their search for sustenance. So they'll feel right at home when they discover this pint-sized feeder in your own backyard.

The paint had barely dried when our first hungry visitor arrived.

LET'S START BUILDING

1 Cut the sides (A), back (B), and front (C) from ½" exterior plywood to the size plus 1" in length.

2 Mark kerf locations 1" center-to-center on the face of the plywood pieces *opposite* the good face, noting their location on the Exploded-View Drawing. Using a table saw, cut ⅛"-deep kerfs in the good face of each plywood piece.

3 Lay out the roof pitch on the top end of each side piece, using the dimensions on the Exploded-View Drawing. Cut the rooflines where marked. Next, cut a 30° bevel on the *top end* of the front and back. Cut the sides, back, and front to finished length.

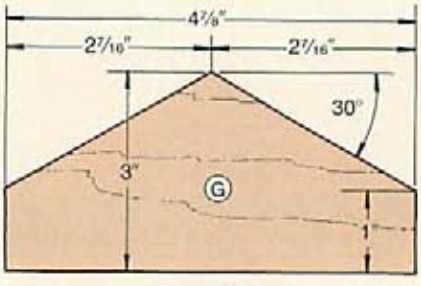
4 Cut the bottom (D) and the feed slide (E) to size, bevel-ripping both *edges* of the slide at 45°.

5 Epoxy and nail the back (B) to the bottom (D), checking for square. (See our source for epoxy in the Buying Guide.) Epoxy and nail the sides (A) to the back and bottom assembly. Then, epoxy the feed slide inside the assembly (we used masking tape to hold the slide in place).

6 Spread epoxy on the side edges of the front (C), spread the sides (A) apart slightly, slide the front in position, and nail it in place. The front's bottom should stop ¾" above the bottom (D) for the feed to pass through.

BUILDING THE ROOF AND THE FEEDING SHED

1 To make the removable gable roof and shed roof, cut three roof parts (F) to size, bevel-ripping one side edge of each at 30°. Lay out and cut the roof supports (G) to shape, using the drawing at *right* as a guide.



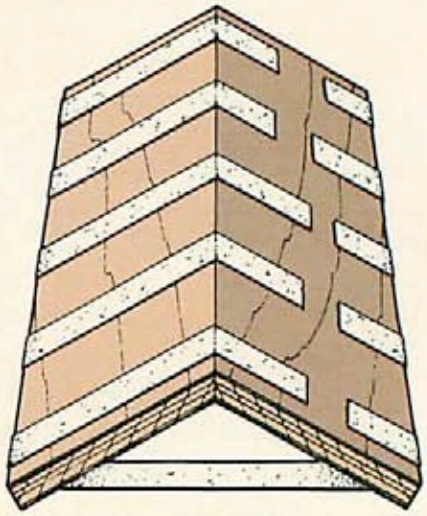
GABLE ROOF SUPPORT

2 Spread epoxy on the beveled edges of the gable roof sections, and tape them together as shown in the drawing *below*. Remove the tape after the epoxy has cured. Then, epoxy and tape the supports in position where dimensioned on the Exploded-View Drawing.

3 Cut a strip of plywood 1¼" wide by 16" long for the feeder sides (H) and front (I). Mark the kerf locations 1" center-to-center, and cut the kerfs in the long strip. (For safety reasons we cut these kerfs on our radial arm saw by raising the blade ⅜" above the surface of the table.) Cut the sides and front to finished lengths so the kerfs are located where shown on the Exploded-View Drawing.

4 Epoxy and nail the sides and front to the feeder assembly.

5 Cut the front pillars (J) to size, miter-cutting the top end of each at 30°. Spread epoxy on the mating surfaces of parts H and I, and clamp the pillars in position.



GLUING THE ROOF

6 Spread epoxy on the top of the pillars and on the beveled edge of the lower roof (F). Tape the roof in position so it overlaps the feeder ½" on each side. Remove the tape after the epoxy has cured.

FINISHING UP

1 Sand smooth, and paint the birdfeeder as desired. (To get the weathered look, we applied exterior latex paint to one side at a time, waited about 30 seconds, and then wiped off just enough paint to expose the wood grain.) After the paint dries, fill the kerfs between the shed roof and front piece (C) with clear silicone to keep water from running down the elevator front and into the seed tray.

2 Use the full-sized pattern on the opposite page as a guide to make the decorative sign. (We cut a piece of ⅛" clear acrylic to the shape of the sign and drilled two 7/64" mounting holes through the acrylic. Then, we lightly sanded the front of the acrylic with 320-grit sandpaper and painted the sign with an enamel paint on the sanded surface. Finally, we screwed the sign to the front of the elevator.)

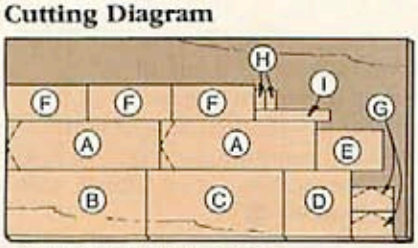
3 Center and mount a 1¾" pipe flange to the bottom of the feeder. Mount the feeder to a 1¾" pipe that has the top end threaded to mate with the flange. Lift the gable roof assembly off the elevator, fill with bird feed, and watch the birds come home to roost.

BUYING GUIDE

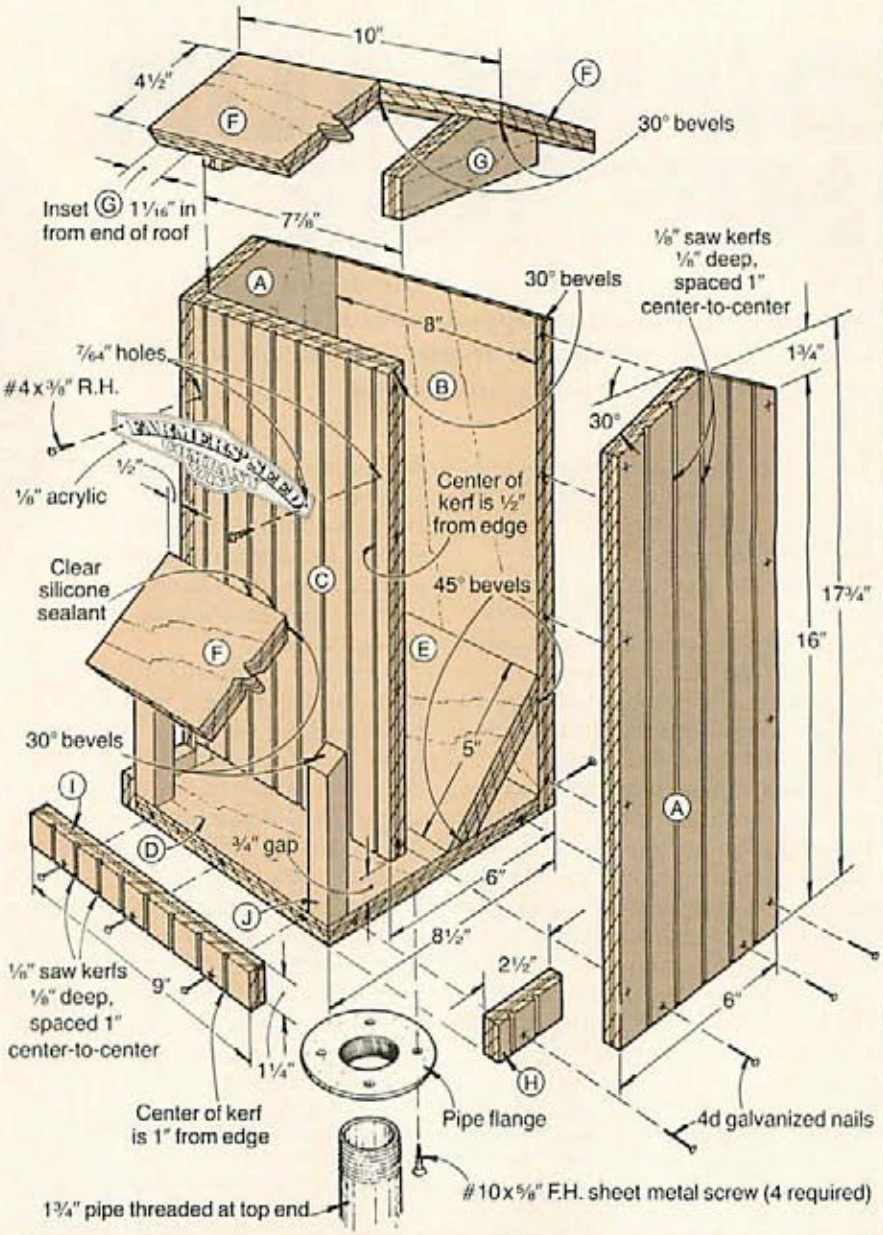
• *QUICK CURE.* Epoxy resin, ½ pint kit, solidifies in five minutes, $8 plus $2 shipping. System Three Resins, P.O. Box 80723, Seattle, WA 98108.

Project Design: Marlen Kemmet
Illustrations: Kim Downing; Bill Zaun

Cutting Diagram



½x24x48" Exterior Plywood



Bill of Materials

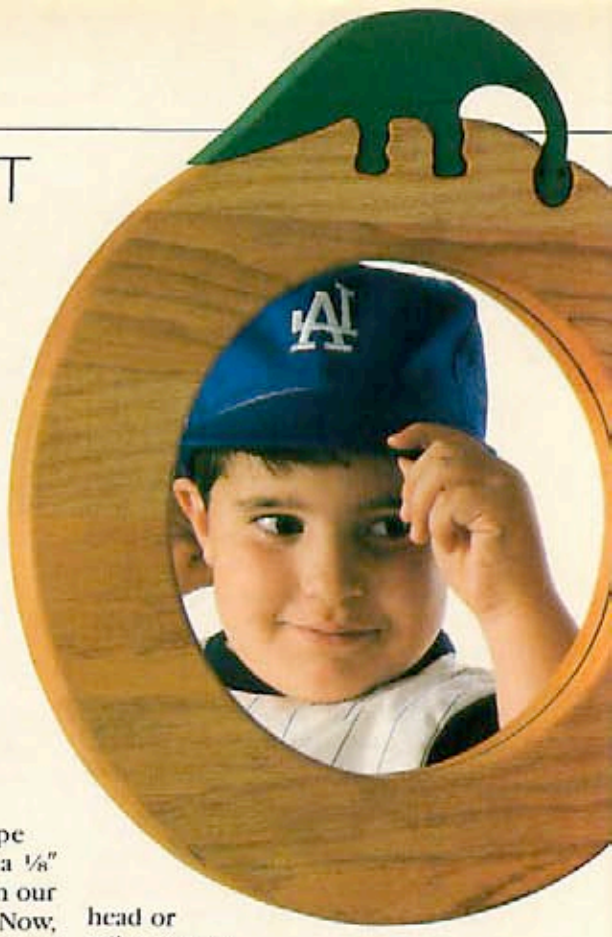
Part	Finished Size* T	W	L	Material	Qty.	Part	Finished Size* T	W	L	Material	Qty.
A*	½"	6"	17¾"	ext. plywood	2	F	½"	4½"	10"	ext. plywood	3
B*	½"	8"	16¼"	ext. plywood	1	G	½"	3"	4⅞"	ext. plywood	2
C*	½"	8"	15"	ext. plywood	1	H	½"	1¼"	2½"	ext. plywood	2
D	½"	8"	8"	ext. plywood	1	I	½"	1¼"	9"	ext. plywood	1
E	½"	5"	8"	ext. plywood	1	J	¾"	¾"	5½"	pine	2

*Parts marked with an * are cut larger initially, and then trimmed to finished size. Please read the instructions before cutting.

Supplies: epoxy, 4d galvanized nails, gray exterior latex paint, clear silicone sealant, 1—1¾" pipe, 1—1¾" flange with #10x⅝" flathead sheet-metal screws, ⅛" acrylic, 2 — #4x½" roundhead wood screws, masking tape, enamel paint for sign

THE EXTINCT, BUT DISTINCT DINOSAUR MIRROR

Reflect a youngster's interest in the age of dinosaurs with this brontosaurus-topped mirror. We've had a lot of fun with this mirror frame, and so will some youngster when it's hung on his wall.



1 Glue and edge-join enough 1 1/16" oak stock together to form one piece measuring 10x16" long and one 8 1/4x16" long.

2 Joint *one* edge of each glue-up and tape the *joined* edges together where shown on the drawing *below*.

3 Locate the radii center point on the joined edges where shown on the drawing. With compass, mark a 7 1/2" radius and a 4 3/4" radius.

4 Using a square, draw a centerline through the center point and to the top of the lamination where shown.

5 Using carbon paper, transfer the dinosaur outline and eye locations to the top of the lamination from the full-sized pattern on the next page. Position the alignment mark on the dinosaur with the marked centerline on the top oak piece.

6 Remove the tape and separate the two pieces. Band-saw the inside radius to shape on both pieces. Glue and clamp the halves together aligning the inside edges.

7 Cut the dinosaur to shape from the top piece. (We used a 1/8" blade with 14 teeth per inch on our band saw to make the cut.) Now, cut the outside frame diameter to shape. Drill a pair of 1/8" holes 1/8" deep where marked for the dinosaur's eyes.

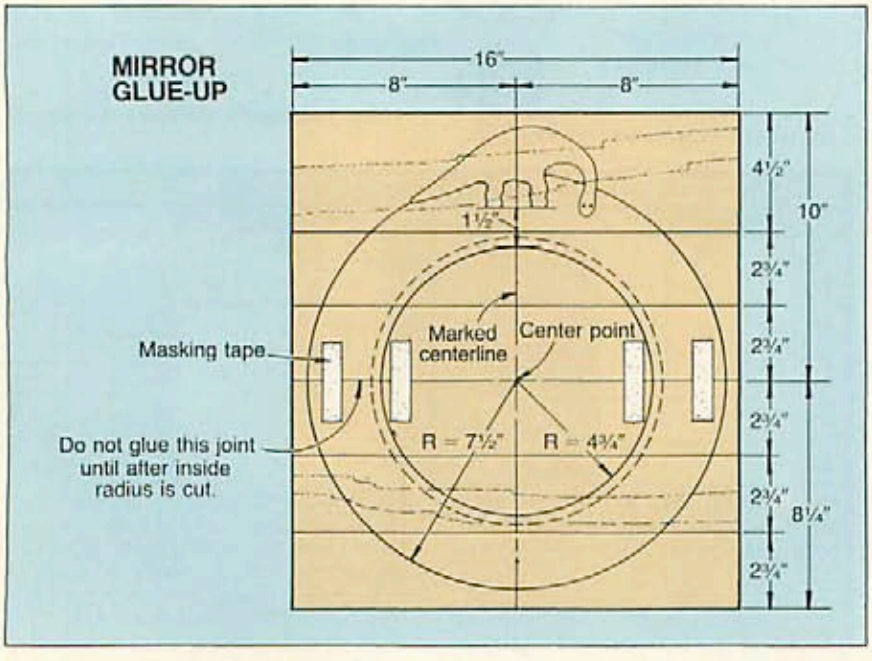
8 Sand the inside and outside edges smooth. Rout a 3/8" rabbet 1/4" deep on the *back* side of the frame for the mirror. Rout a 1/4" round-over on the *front-outside* edge, being careful not to rout into the the dinosaur's head or tail openings. Rout a 1/4" round-over on the *front-inside* and *back-outside* edges.

9 Finish-sand the mirror frame and dinosaur. Stain and finish as desired. (We used latex acrylic paint on the dinosaur and a light stain and Minwax Antique Oil on the frame. Spray paint would also work on the dinosaur.)

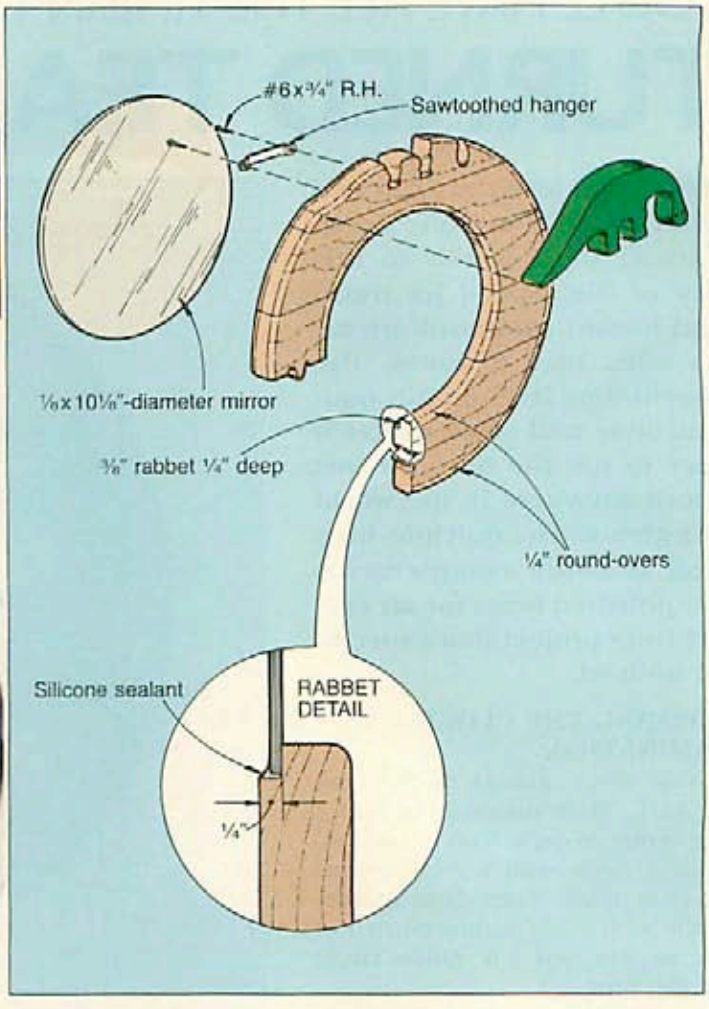
10 Have the mirror cut to shape (we had ours cut 1/8" undersize to allow for expansion of the wood). Center the mirror in the rabbet so the gap between the frame and mirror is equal all the way around. Adhere the mirror to the frame by running a bead of silicone sealant in the gap around the mirror where shown in the Rabbet Detail.

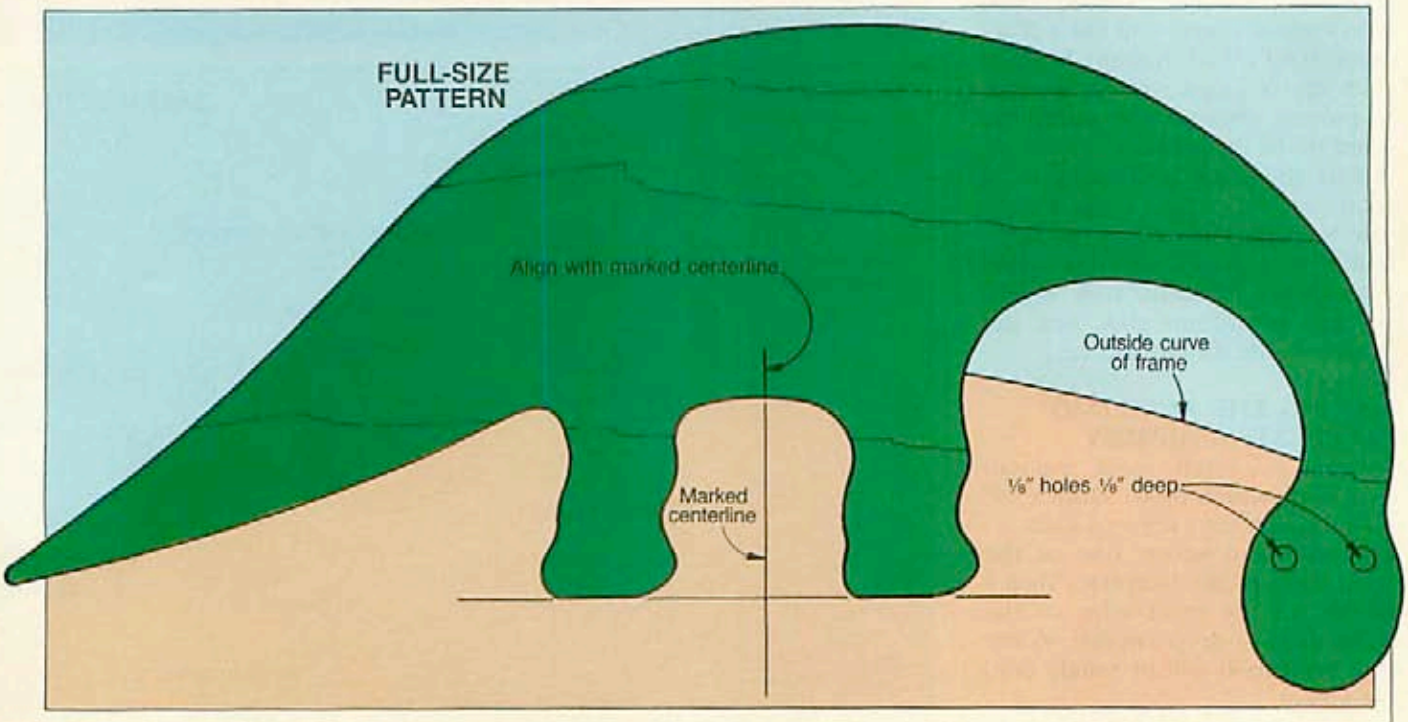
11 Fasten a sawtoothed hanger to the back of the mirror frame, hang on a wall, and slide the dinosaur in place. Finally, stand back, look in the mirror, and ask "who's the fairest woodworker of them all?"

Supplies: carbon paper, 1/8x10 1/8" mirror, sawtoothed hanger with 2 — #6x3/4" roundhead wood screws, silicone sealant, stain, finish, paint for dinosaur



Project Design: Gene Scherer
Photograph: Bob Calmer

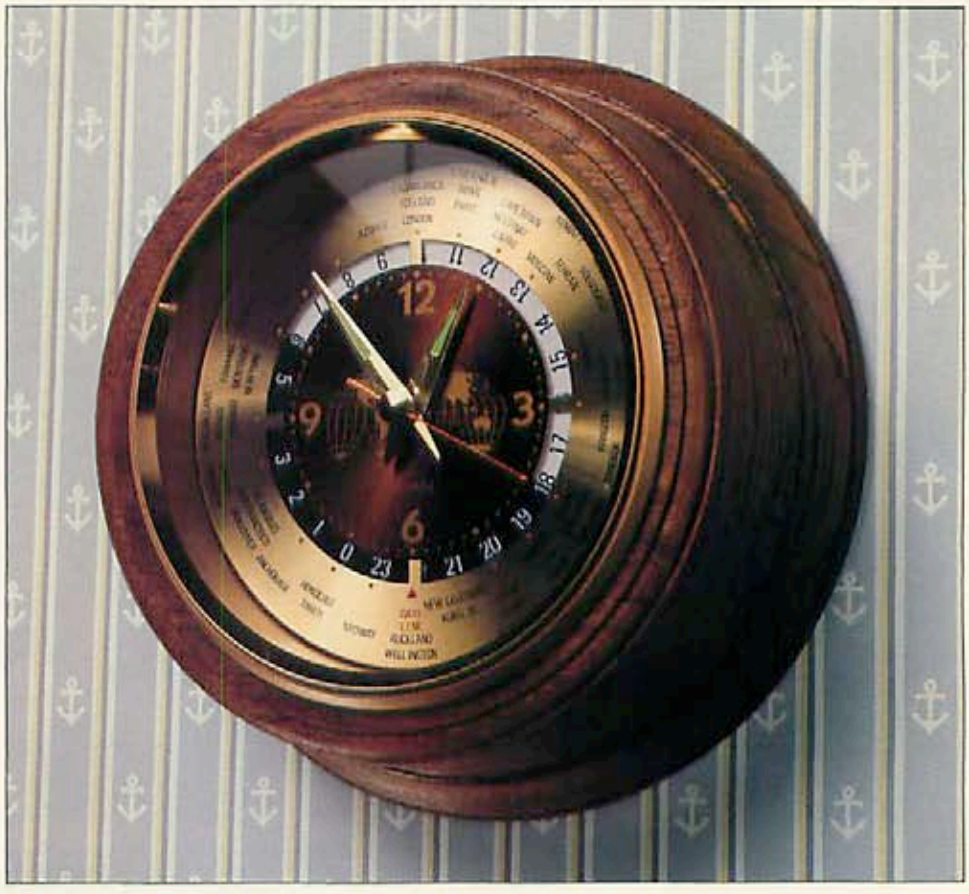

#6x¾" R.H.
Sawtoothed hanger
⅛x10⅛"-diameter mirror
⅜" rabbet ¼" deep
¼" round-overs
Silicone sealant
RABBET DETAIL
¼"


FULL-SIZE PATTERN
Align with marked centerline
Outside curve of frame
Marked centerline
⅛" holes ⅛" deep

YOU'LL HAVE ALL THE TIME IN THE WORLD WITH OUR

TURNED TEAK TIMEPIECE

Have you ever wondered what time it is in Hong Kong, Caracas, or Helsinki? In this day of high-speed jet travel and instant communications, it's often nice to know. The "world-time face" on our nautical-style wall clock makes it easy to tell the time for just about anywhere in the world at a glance. The quick-to-turn teak housing complements the polished brass for an eye-catching project that's sure to be noticed.



FORMING THE CLOCK LAMINATION

1 Cut three pieces of ¾" teak to 8x8". Mark diagonals to locate the center of each. With a compass, draw a circle with a 2 13/16" radius on each square. Then, draw another circle with a 3⅝" radius on *two* of the squares, and a 4" radius circle on the *third*.

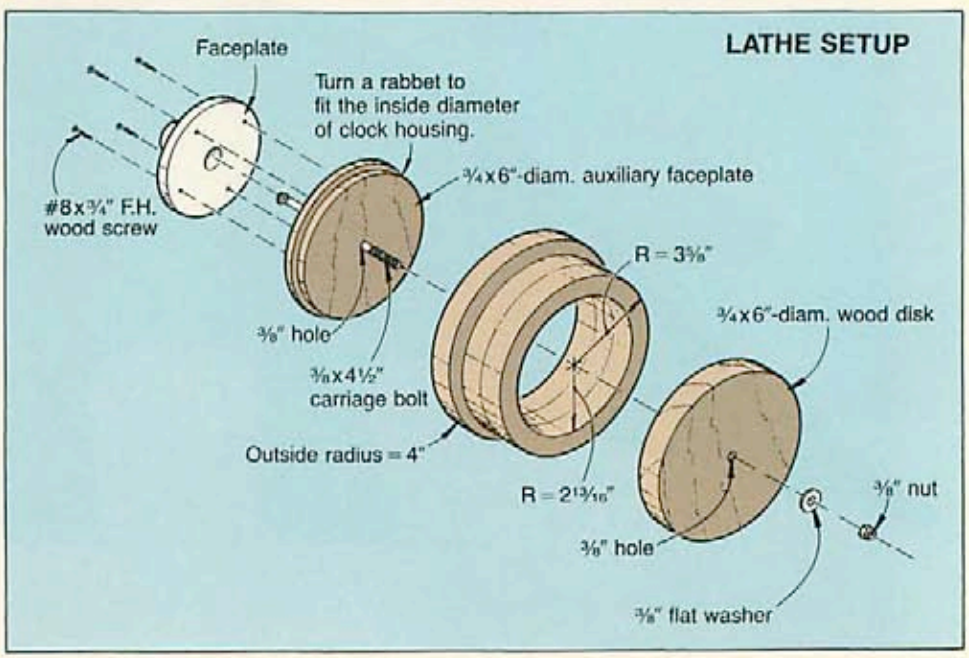
2 With a circle cutter chucked into a drill press, center and cut a 5⅝"-diameter (2 13/16" radius) hole in each square. (Back with scrap stock to prevent chip-out, and clamp the work to the drill press.)

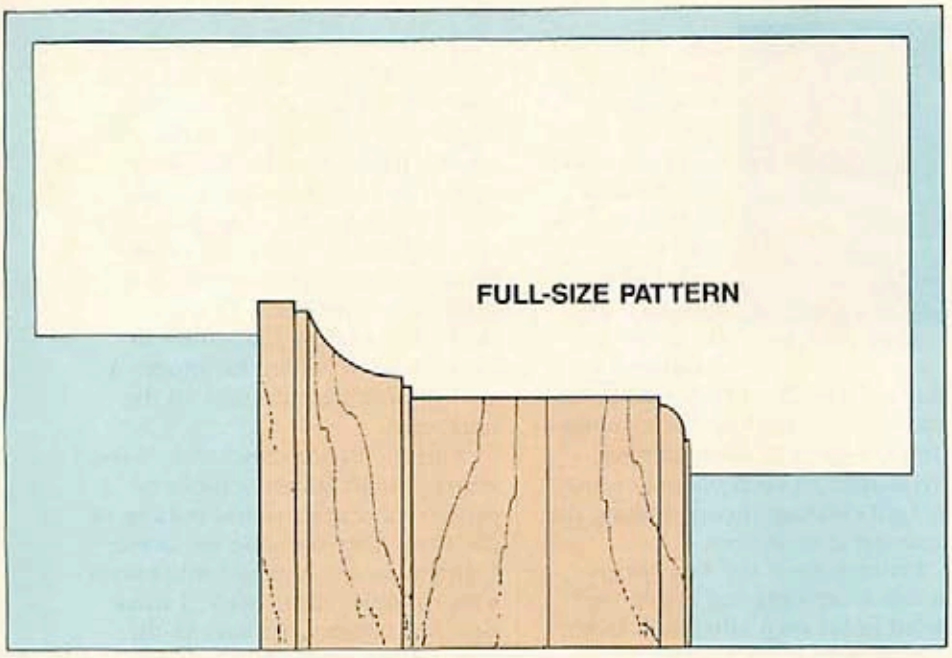
3 Cut the outside diameters of each square to shape using a band saw. Now, glue and clamp the three teak rings together with the inside edges flush. (Because teak is oily, we use resorcinol glue. See the Buying Guide for our source.)

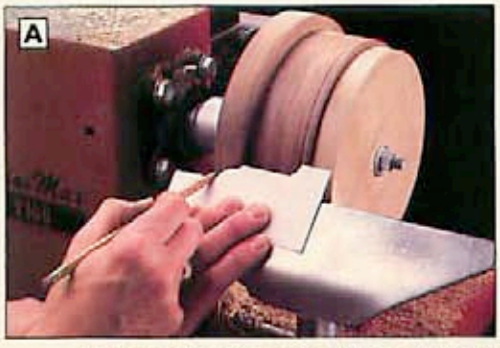
MAKING THE AUXILIARY FACEPLATE ASSEMBLY

1 From ¾" scrap, mark and cut two 6"-diameter disks. Drill a ⅜" hole through the center of each.

2 Center and screw one of the scrap disks to the faceplate. Turn a rabbet on the front edge of the scrap disk — deep enough so the teak lamination will fit snugly onto the rabbet.

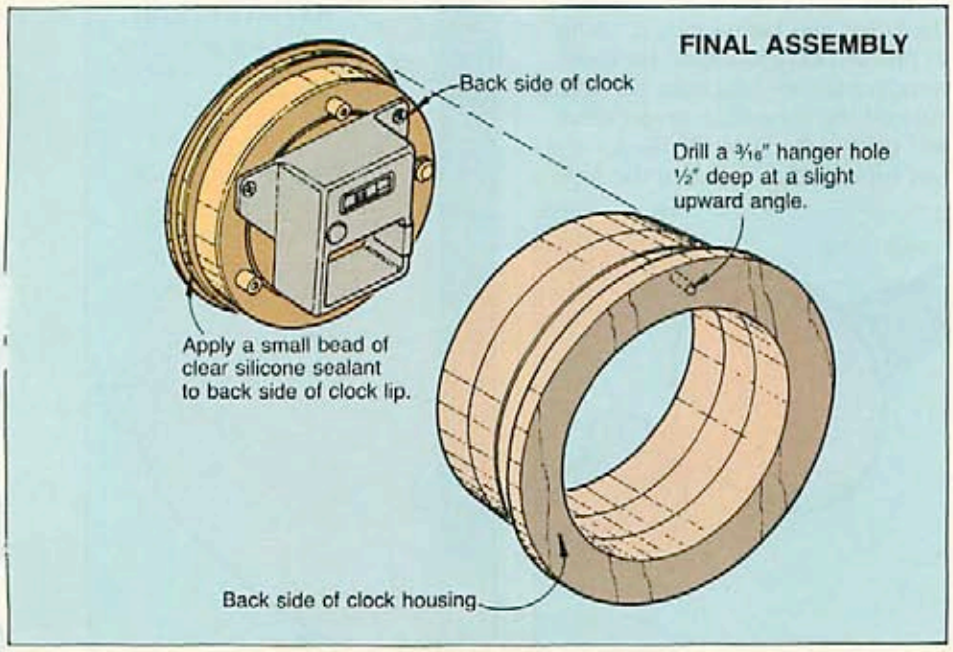






Mark profile lines on teak lamination with the lathe running.

Turn the lamination to shape using the marked profile lines as guides.


FINAL ASSEMBLY
Back side of clock
Drill a 3/16" hanger hole 1/2" deep at a slight upward angle.
Apply a small bead of clear silicone sealant to back side of clock lip.
Back side of clock housing

3 Remove the rabbeted disk from the faceplate. Slip a ⅜x4½" carriage bolt through the back side of the disk. (If your faceplate doesn't have a center hole, you'll need to counterbore the back side of the rabbeted disk for the head of the carriage bolt.) Remount the disk to the faceplate.

NOW, TURN THE CLOCK BODY

1 Center and bolt the teak lamination between the disks as shown on the Lathe Setup Drawing.

2 Start the lathe, and true up the outside surface of the teak housing (we used a speed of about 1,000 rpm and a ½" gouge).

3 Make a template from the full-size pattern at *left*.

4 With the lathe running, lay the template up against the turning. Transfer the profile lines from the template to the teak lamination as shown in photo A.

5 Using the lines as guides, turn the lamination to shape, stopping periodically to check the housing shape against that of the template. Turn to shape as shown in photo B. Sand the lamination smooth.

6 Remove the clock housing from the lathe. For hanging the clock later, drill a 3/16" hole ½" deep at a slight upward angle where shown on the Final Assembly Drawing at *left*.

7 Apply finish to the interior and exterior (we used polyurethane). To hold the clock movement to the teak housing, apply a small bead of silicone sealant to the back lip of the clock ring where shown on the Final Assembly Drawing. *Install the* battery, set the time, and slip the clock movement into the cavity.

BUYING GUIDE

- **World-time quartz clock movement.** Requires one "C" battery, catalog no. 15012, $17.75 plus $3 postage. Klockit, P.O. Box 629, Dept. WD97, Lake Geneva, WI 53147.
- **Resorcinol-resin glue.** ¼ pint, catalog no. 28WPG1, $10.20 ppd. Constantine, 2050 Eastchester Rd., Bronx, NY 10461-2297.

Project Design: James R. Downing
Photographs: William Hopkins; Bob Calmer
Illustrations: Kim Downing; Bill Zaun

TURN A BERNSON SHOWCASE VASE

A TEST TUBE INSERT ENABLES THIS BEAUTY TO HOLD FRESH-CUT FLOWERS

One in a collection of turning patterns from the nation's top woodturners

Bruce Bernson

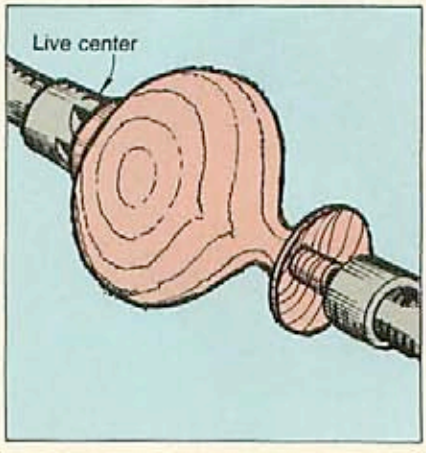
Bruce Bernson, a self-taught woodturner, lives near the beautiful coastal city of Santa Barbara, California. He has been known to search as far as Oregon for uniquely grained woods such as wild lilac and buckeye burl for his turnings. He's even found some turning "treasures" in such unlikely spots as land-clearing sites and along the seacoast after storms.

Bruce turned the vase shown at *left* from a big-leaf maple burl dried in his own kiln (built from a 2,000-gallon gas tank).

Here's how Bruce turns this vase: "I start with a cube of wood approximately 4½" square. I bandsaw the block to a cylindrical shape and mount the block between centers. Next, I turn it round, and remove stock from the ends to form two dowel-like supports."

Bruce uses a ½" roundnose scraper to form the sweeping neck and bulbous body. (See the full-sized half pattern at *right*, and the drawing *below*.)

To finish the vase, this craftsman turns it as smooth as possible on the lathe, and hand-sands it, using as fine as 600-grit paper. He then removes the turning from the lathe, cuts off the dowellike projections, and drills a 9/16" hole 3" deep for a test tube in the center of the top.



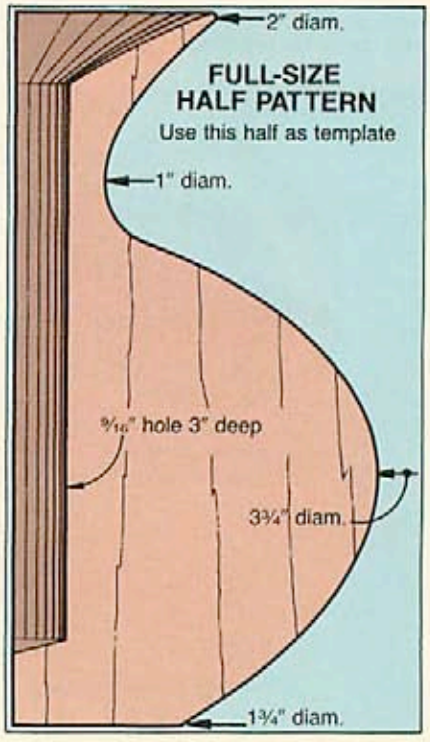
As Bruce explains, "I apply a single coat of Watco Danish Oil to the vase and allow it to dry for three days." Still not satisfied, Bruce then applies tripoli to a 10"-diameter cotton pad mounted to an arbor, and hand-holds the vase against the spinning pad to buff it. At a point where most people would call it quits, Bruce proceeds to use a lamb's-wool bonnet mounted to another arbor, where he applies a coat of pure carnuba wax to the burl vase.

"Finally," Bruce concludes, "I use white glue to adhere a piece of protective leather to the bottom of the vase. After the glue has dried, I trim away the excess leather with a sharp utility razor blade. I then sign and number the vase in the wood along the leather base with a woodburning tool."

BUYING GUIDE

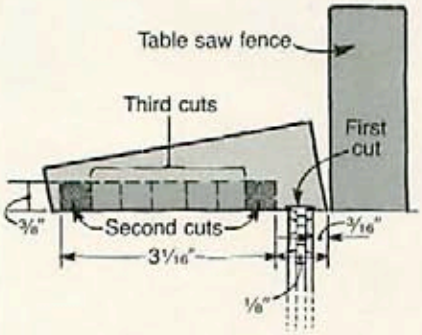
- **Maple burl turning square and test tube.** A 4½" square and a ½x3" test tube for $10 plus $2.50 shipping from Bruce Bernson, 2791 Painted Cave, Santa Barbara, CA 93105.

Photographs: Bob Calmer; Dan Olmstad
Illustrations: Kim Downing



NOTEWORTHY NOTEPAD HOLDERS *Continued from page 63*

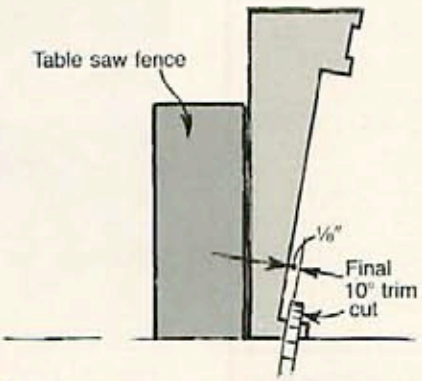
for our source of inlay). Referring to the drawing *below*, position the rip fence 3/16" from the inside edge



of the dado set. Raise the blade to a height that equals the thickness of the inlay strip. Make the cut.

7 Make the second set of cuts 3/8" deep where shown in the drawing *above*. Remove the material left between those two dado cuts by making the *third* set of cuts, also shown *above*.

8 Use a single blade to make the final trim cut at a 10° angle along the front edge where shown in the drawing *below*.



9 Glue the inlay in the shallow groove, and crosscut the lamination into two 5 1/16" lengths.

10 Resaw a 1 1/2"-wide strip of walnut to 3/8" thick. Crosscut two 2"-long pieces from the strip for the pen holder blocks.

11 Sand a slight round-over along the top edges of each lamination and pen holder. Now, glue and clamp the pen holder blocks in position. Drill a 3/4"-deep hole at a slight angle in each pen holder to fit the barrel end of your favorite pen. Sand both holders smooth.

12 Apply a clear finish and glue a piece of felt to the bottom of each holder. Remove the brown paper backing from the backs of the Scotch Post-it Note Pads. Apply two strips of tape where shown on the Notepad Holder Drawing. (The adhesive-backed pads stick better to the tape surface.)

BUYING GUIDE

• **Inlay border.** Catalog no. B71, minimum length of 36" for $5 ppd. Constantine, 2050 Eastchester Rd., Bronx, NY 10461-2297.

Photographs: Bob Calmer; William Hopkins
Illustrations: Kim Downing

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15" Scroll Saw

- Comparable to Hegner or Delta
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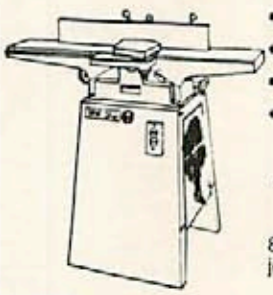
- 110v
- Work and storage table included at no charge. A $49.95 value
- 25 assorted blades included

$199.00
(Shp. & Hdlg. $20.00)



6" Heavy Duty Jointer

- 3/4 hp, 110v
- Adjustable speeds
- Fully adjustable
- 190 lbs.

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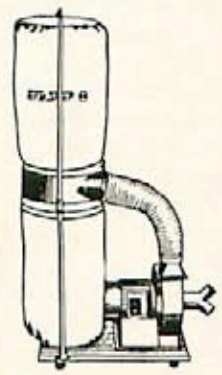

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AP10	Planer Blades	25

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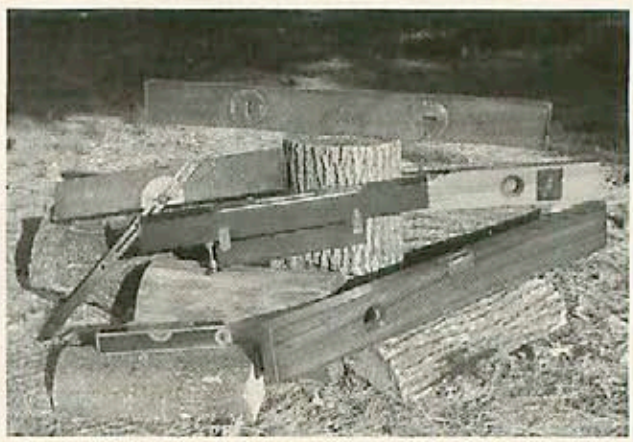
THE SPIRIT LEVEL

CRAFTSMANSHIP AT A GLANCE



Clockwise, from top: **Mahogany with vial covers, level with protractor, rosewood level and plumb bob, rosewood pocket level, mahogany level with top and butt plates, cherry level.**

Spirit levels, the kind with the bubble in the vial, were first used by surveyors in the 1700's. It wasn't until 150 years later, however, that spirit levels were manufactured in sufficient quantity to supply general craftsmen. Before then, to make sure something was level, they relied on a version of the plumb bob.

Adjustments to fight warp

The first levels were quite simple, with vials mounted in plain wooden stocks. However, the wood tended to warp slightly, or wear, and throw the level out of plumb. Eventually, tough, stable woods, such as beech, boxwood, cherry, and mahogany — even ebony and rosewood — proved more reliable. Finer levels were bound with brass top plates and butts. After 1860, set screws provided for adjustment.

Cast iron and iron filigree models first appeared after the Civil War, and conquered the warping problem. By 1940, mass-produced metal levels finally replaced the wooden level as the most popular.

Price matches beauty

Levels vary from pocket-sizes 2" to 5" long to mason's and builder's levels over 10'. Unusual patent designs include those with 100° protractors, inclinometers, and combination level, plumb, and rule.

You'll pay for craftsmanship. Like sleek, imported sports cars, fine levels look expensive. Exotic woods, brass bindings, ornate cast iron and filigree stocks, and unusual designs bring highest prices.

Condition affects value, too. A level shouldn't show much wear. A maker's mark on the stock or stamped in the top plate also makes it worth more.

Levels represent a somewhat neglected area of collecting. You'll find most selling for $5 to $150. A very rare example may bring $1,000.

Photograph: Jim Elder

SHOP SENSE

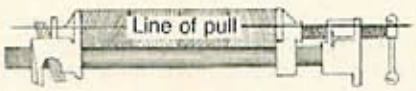
3 RULES FOR EDGE-JOINING WITH PIPE CLAMPS

1 MAKE SURE THE JOINTS FIT

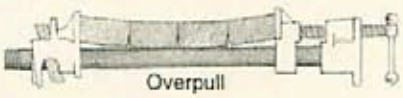
Nothing can make ill-fitting joints close up tight. Before glueing, dry-fit all the joints. If you see "air," re-machine the edges.

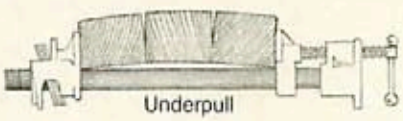
2 ALIGN YOUR CLAMPS CORRECTLY

Don't let the stock wander from your clamps' line of pull. That's the imaginary line running through the clamp's drive handle.

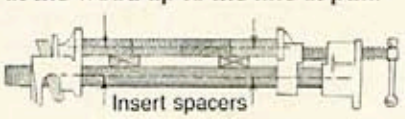


Keep the line of pull parallel to the pipe. It seems simple, but there's one pitfall — using the wrong size of clamps. The largest clamps, called ¾" (the diameter of pipe they fit), have longer jaws. Use these clamps on stock ¾" to 1" thick, the smaller on thinner stock. Otherwise, you'll have overpull or underpull, as shown *below*:





To use pipe clamps larger than the wood thickness insert spacers as shown *below*. This brings the center of the wood up to the line of pull.



Another technique is to "roll over" the larger clamps on the edge of the wood to compensate for their size, as shown *below left*.

To use smaller clamps on thick stock "double-clamp," as shown *below right*. Place one of the smaller clamps so that its line of pull centers in the stock just as a larger clamp would.

3 BALANCE THE CLAMPS AND NEVER OVERTIGHTEN

Alternate clamps from side to side first on top, then bottom working from the center toward both ends to even up the pressure.

Overtightening clamps will either bow or cup the workpiece. Or, the pipe itself will bend slightly.

Illustrations: Jim Stevenson

Some PLAIN FACTS About The RBI Woodplaner™

FACT #1 — Precision & Accuracy. They're both built right into the RBI Woodplaners™ and you see it with every piece you produce. We call it "harmonics," or, the perfect balance between cutter head mass (3¼" dia.), blade angle and feed rate. Fifty years of building woodworking tools allowed us to fine tune this balance to perfection. What it means to you is the ability to work any piece of wood — from exotic hardwoods to sugar pine — the way you want it.

FACT #2 — Versatility. Both the 12" and 8" RBI Woodplaner™ models quickly convert to a molder or a surface sander. The patented "Quick-Change" molding and sanding heads install in minutes saving you valuable time and giving you unmatched versatility.

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FACT #5 — Quality. Tested and trusted since 1929. Right here in Harrisonville, Missouri. We won't even buy steel that comes from another country. Everything about the RBI Woodplaner™ is 100% American.

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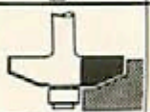	#15	RAISED PANEL	20° Angle	1-5/8"	1/2"	25.00
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	#26	3/8" Straight Bit		3/8"	1"	7.00
	#27	1/2" Straight Bit		1/2"	1"	7.00
	#28	3/4" Straight Bit		3/4"	1"	10.50
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ASK WOOD

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Due to the volume of mail, we can't promise to answer all questions, but we try! Letters selected for use will be edited for publication.

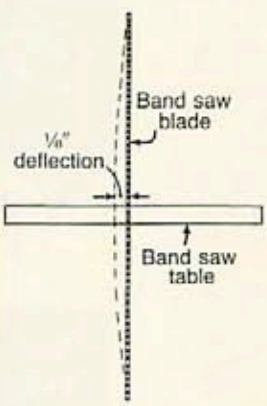
PLUCKING BAND SAW BLADES

Q. *I have often read that a band saw blade should be "properly tuned," but no one tells you how to set the proper tension. And worse still, it seems a lot of new band saws give no indication on the tightening mechanism at all. Is there a simple way to tell what the correct blade tension should be?*

— Standish J. Watson, Palm Springs, Calif.

A. Standish, for many of us, adjusting band saw blades remains an inexact science at best. The scales on saws with tension indicators give an indication of the approximate blade tension required. The Rockwell owners manual, for example, says these graduations will be correct for average work but advises varying the tension for different kinds of blades and cutting. There are also a lot of questions as to just how accurate these scales are on some machines and what happens as the machine parts age.

Lou Brickner at Delta told us that on their saws most of the tension scales are calibrated for standard thickness blades (0.024"). They won't be accurate on the new, thinner blades (0.012-0.015"). He suggests that you first adjust the tension to an approximate setting — either with the indicator or by feel — then test by making a contour cut in a piece of 1"-thick oak. If the blade wanders and doesn't follow the cut line, then you need to increase blade tension.



To adjust by "feel," simply push on the side of the blade at table-top level with the upper guide moved way up. The blade should not deflect more than ⅛" to ¼", depending on its width (see diagram *above*). Some experienced operators

Continued on page 88

ASK WOOD

Continued from page 86

adjust blade tension by plucking the blade and listening to the sound or pitch of the vibrating blade while tightening it. Different blades have their own pitch, like strings on a guitar, so you need to learn to identify each one.

If you want real accurate blade adjustment, consider buying a tension gauge. The instrument sells for about $80 and enables you to set tension to a precise psi setting. Most of the standard-thickness blades require from about 15,000 to 20,000 psi; the thinner blades can require up to 30,000 psi.

Whichever way you do it, Brickner cautions that you tighten the blade just enough to get the cutting performance you want. But don't over tension — it's the most common cause of blade failure. It's also a good idea to relax the blade tension when you aren't using the saw.

GETTING TO THE HEART OF THE PROBLEM

Q. *I am starting in woodworking and don't understand how to saw flitches out of a log ("Air-drying Green Wood," Feb., 1987, p. 65). I have a sawmill but can't figure how to hold logs on the carriage to saw them from point to point. Why couldn't they be sawed in quarter fashion and still have the same grain?*

— Thomas Line, Howell, Minn.

A. Tom, quartering out flitches (small, unsawed pieces) from a short length of log doesn't have to follow a particular pattern. Most of our readers don't have sawmills, so our drawing suggests cuts to follow on small pieces of wood with a chain saw, or even by splitting with an ax or maul.

On a sawmill carriage, the way to do it would be as you suggest — one rip down the middle to halve it, then a rip down each half to quarter. You want to get at the pith — the inner core of the log — to remove it because it often deteriorates quickly.

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THE CASE OF THE HARD-TO-GET SEALER

Q. *Help! I have spent hours trying to find a dealer who sells Parks lacquer-type sanding sealer. This material was described in the polymerized tung oil article, December 1986 issue, pages 52-53. I have not been able to locate the Jasco tung oil locally, either.*

Ron Borrett, Marion, Iowa

A. Ron, prior to publishing the article, we called the manufacturers of the two products to check on their availability nationally. Both firms assured us that woodworkers could obtain the products at the sources listed in the article. Hopefully, this new information will help you and other readers.

The Jasco Company will continue to fill orders for anyone calling the telephone number listed in the article, 415/968-6005.

Unfortunately, locating Parks Lacquer-type Sanding Sealer hasn't been as easy. If you need a source, Miller Hardware, 1300 Harding Rd., Des Moines, Ia 50311, will supply the sealer in quart quantities. Write or call for Gary or Dave (515/283-1724). Price: $5.99 plus UPS charges. They'll accept your check or VISA card number.

Behlen sells a similar product called Qualalacq sanding sealer. It forms a clear film suitable for use under most finishes except polyurethane. You can mail order it from a number of suppliers, including Garrett Wade (800/221-2942), Woodcraft Supply Corp. (800/225-1153), Wood Finishing Supply Co. (315/986-4517), and in Canada, Lee Valley Tools (416/746-0850).

PRESERVING A TREASURED HEIRLOOM

Q. *I recently acquired a wooden trunk my great-great-grandfather brought with him from Germany around 1860. It has been in storage in Missouri for a long time, and I don't think it has even been treated with any kind of preservative.*

I've moved the trunk to Colorado, and I'm afraid the air here may be too dry for it. What can I treat the trunk with so the wood doesn't dry out?

— Michael E. Huffman, Lakewood, Colo.

A. Michael, wood, no matter how old, continually loses and gains moisture from the atmosphere. Most of the time this occurs without harmful effect.

You probably don't need to do anything to the trunk. The moisture changes indoors between Missouri and Denver really shouldn't cause problems. But if you are concerned, you may use a clear oil finish, such as tung oil, Danish oil, or a wood restorer such as lemon oil, to seal the wood and stabilize it. This helps prevent rapid moisture gain or loss. Varnish or polyurethane may change the wood's patina.

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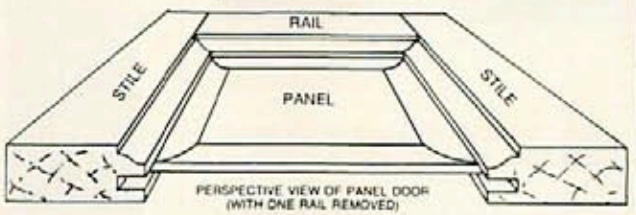

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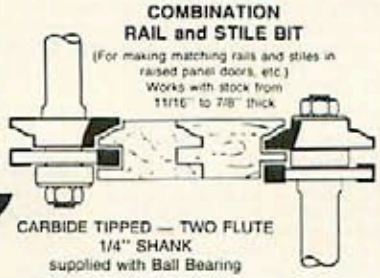

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How to be a HARDWOOD SUPERSLEUTH

Continued from page 73

TESTS FOR IDENTIFYING DOWNED TIMBER

- **Should it grow here?** A reference book can help weed out lots of trees. Little tips such as "range limited to coast of northwest Oregon" save you extended probing if the downed tree you're identifying happens to be in upstate New York.
- **Use common sense and scents.** Sheer size eliminates some candidates. It would be the rare persimmon that grew to oak-size.

Activate a wood's scent by cutting a fresh spot or chip in the heartwood, then rub in a little saliva. With many woods, an identifiable smell lingers even when it has been down a long time and is as dry as a bone. Practice sniffing the hardwoods you know when you work them in the shop.

- **Does color ring a bell?** Osage orange's bright-yellow wood pegs it right away. And who could mistake the distinctive, dark richness of black walnut? Would you recognize cherry? Study dry, unfinished stock to build up your recognition bank. On downed wood, you'll have to chip away dirty, weathered wood to see any true color.
- **Is it bogus bark?** Sometimes a good clue, as with white birch. But bark varies too much to always be reliable. Walnut sometimes has bark that resembles black cherry. Trees of varying ages in the same species can have entirely different-looking bark. Where a tree grows and the rate it grows also affect bark color and texture.
- **Work the wood.** Use a knife or a hatchet to remove a section of outer bark about the size of your shoe. Keep peeling until you've gone through the inner bark. When you get to solid wood, slice a flat surface. The color may be lighter, because you're looking at sapwood, but the grain runs the same as flat-sawn stock from your hardwood dealer.

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THE PERFECT FINISH

Finishing Pine

For an Early American Look

Much of pine's beauty comes from the patina it builds up over the years. But what about that new pine project you're planning? Here's how to give it an old-pine look.

Although you'll never duplicate the wonderful patina of a 200-year old, museum-quality pine piece, you can greatly enhance the appearance of a new pine project by giving it a special, Early American, mellow look. There are several ways to approach it: Start with the right (and more expensive) kind of pine, or use a lesser pine and finish the piece with some proven tricks.

THE BEST WOOD MAKES IT EASIER

Selecting the right wood, such as white western pine, does wonders from the beginning. Usually, this pine is called "Idaho white pine," and carries the initials "IWP" in the grade stamp on every board. White eastern pine and sugar pine will also work. Look for these pines in small, independent lumberyards or those catering to cabinetmakers. You can also special-order.

HOW TO MELLOW THE YELLOW

If you want to use less expensive, construction-grade pines — ponderosa, lodgepole, or southern yellow — you'll need to work some finishing magic. That's because these yellow pines have alternating soft, then hard, grains that end up looking like a zebra when they're stained.

To mellow the stain on yellow pine, you need to cut down on how much the soft grain absorbs it, and increase the hard grain's ability to hold it. And that's not as difficult as it sounds.

To reduce the soft grain's porosity, give the raw wood surface a quick coat of ordinary 3-lb. shellac diluted 50/50 with denatured alcohol, *before* sanding. Be sure to make it a light coat.

After the shellac dries, sand it lightly with 120-grit sandpaper, then apply the stain. The shellac penetrates deeply into the soft grain, reducing its ability to absorb the stain. At the same time, the light sanding removes the shellac from the hard grain, letting it absorb stain. This technique mutes high contrast, but it has two drawbacks: First, you must spend more time on finishing; second, clogging the soft wood with shellac makes the dark, old-pine look more difficult to achieve. The finish never looks dark enough, no matter how many coats of stain you apply. But, it's close.

TREAT THE WOOD ROUGHLY

This second technique uses no shellac precoat. Instead, you first sand with no finer than 80-grit sandpaper, then apply your stain.

Strange as it sounds, it's better to omit fine sanding. On yellow pines, you want to rough up the wood, not smooth it down.

Using coarse sandpaper leaves fine grooves on the hard grain that capture stain and lessen contrast. Both the sand-and-shellac technique and this one avoid stain contrast, but only the rough-sanding procedure allows you to darken the wood as much as you want for an Early American look. However, even that takes a special touch.

Continued on page 94

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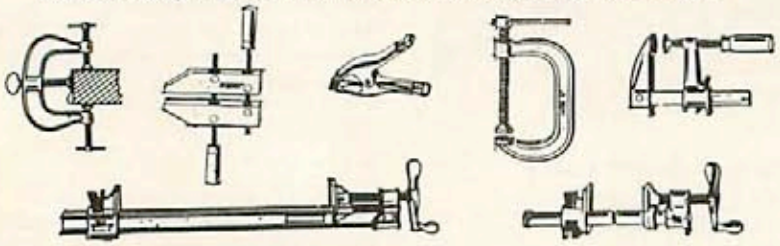

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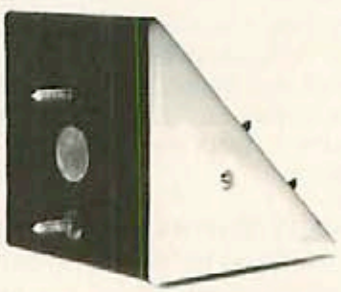

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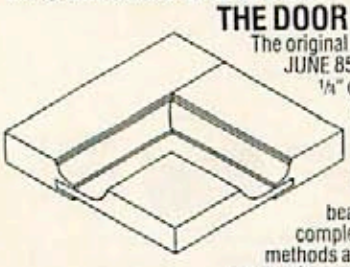

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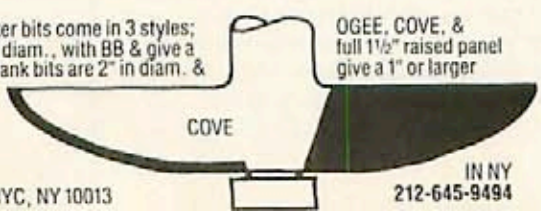

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Continued from page 93

Finishing Pine for an Early American Look

STAINS MAKE A DIFFERENCE, TOO

To cover the hard grain and cut down the contrast, use a muddy, heavily pigmented, dark brown stain with a reddish hue. This helps mask the yellow tint of yellow pines, and creates a warm, orange highlight in the finish.

You'll want to leave some of the stain's pigment on the wood's surface, so allow an extra day of drying time. If you don't, the first coat of sealer you put on may pick up the pigment and move it around. The result? Blotchiness in the stain that'll ruin your project.

START YOUR FINISH WITH ORANGE SHELLAC

Before applying a final, durable varnish, perform one more finishing trick. After the stain has dried thoroughly, put on a couple of full-strength coats of 3-lb. orange shellac. Because shellac is alcohol-based, it doesn't usually soften an oil-based stain, and it won't bother a water-based one. It gives your wood the appearance of old-pine patina, and builds up on the surface quickly, adding depth and compensating for the roughness. Without the shellac coating, you'd spend extra time and money on extra coats of varnish.

On yellow pines, you want to rough up the wood, not smooth it!

To complete the Early American look, use a satin rather than a gloss varnish — it makes the grain less obvious. And be sure the varnish will work with the shellac you used. Some varnishes, especially those containing stearic acid, tend to bubble up when put down over shellac. As always, test the varnish and the shellac's compatibility on scrapwood before you begin the finishing.

Written with John Arno
Illustration: Jim Stevenson

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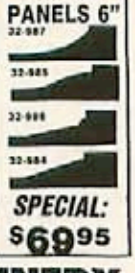

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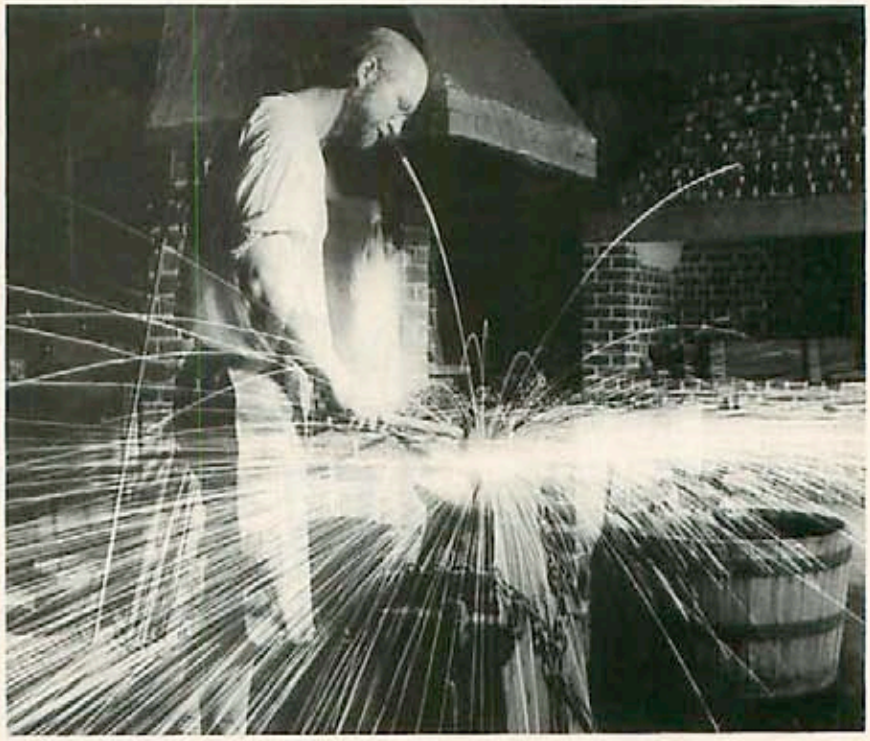

Hot flux of melted sand or borax splatters as blacksmith Rick Guthrie welds the steel bit into the iron axhead.

A new ax was born today. True of eye and with strength of steel, it will sunder a thousand trees before its work is done.

By Roy Underhill

Master housewright at Colonial Williamsburg and host of the popular PBS series The Woodwright's Shop, *Underhill is also an author and lecturer.*

Most folks know the blacksmith for his work — the ax with perfect balance, the chisel that holds an edge. He was the central tradesman in colonial life, not only for his tools, but for his role as farrier, maker of wheel rims, and metal worker par excellence.

Blacksmith Rick Guthrie of Colonial Williamsburg fills that role today. He practices his trade as it has been done for hundreds of years. But perhaps none of his skills can match those he uses at the fiery birth of an ax.

A head of no casual design

Mined in the hills, then brought by wagon to the smeltery for purifying, the iron ore becomes a solid iron bar for the blacksmith to further render. He begins by outlining with soapstone the area on the bar that he will spread and thin to form the ax eye.

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The design doesn't come from casual estimation. It follows a specific form of the 18th century with a slight poll and full lugs, or ears, descending on either side of the eye. Ears strengthen the handle by limiting its side to side movement, yet won't hamper its flex.

Forging with yellow heat
Into the fire goes the outlined iron, centered in the heat blast created by bellows blowing over the coals. The blacksmith watches for the bright yellow heat, then selects the right set of tongs from the more than a dozen different sizes and shapes before him. The tongs' tremendous leverage enables him to hold and control the glowing iron with one hand.

With the tongs, he draws the iron from the fire and centers it on the anvil. Then, using a cross-peen hammer, he thins and spreads the bar to form what will become the wrap-around hole for the handle — the eye of the ax. Speeding the work, an assistant called the "striker" follows the blacksmith's hammer blows with strikes from a heavy sledge. After a minute, the iron goes back into the fire for the second heat.

Soon, the iron comes out of the fire again. This time it will be formed with a set hammer. It allows more precision than free-swung blows. The striker still swings his sledge, but now he hits the set hammer placed at different points determined by the smith.

Set. Strike. Set. Strike. The men work until the developing eye takes the form and symmetry of a butterfly with wings unfolded. Before the redness fades, the wings get folded together.

A weld critically fused
Where the iron had been molded at yellow heat, it must now meet the hotter, white heat of welding. But such heat promotes the

Continued on page 98

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OLD HAND WAYS

Continued from page 97

formation of surface oxides — gray, flaky scale that might get sandwiched in the joint to prevent bonding. To prevent oxide buildup on the iron, Guthrie protects it with a glassy coating of molten flux (sand or borax that melts in contact with the hot iron). When he joins the surfaces together with the sledge, the molten flux flows to the outside of the joint, allowing the bare iron wings of the eye to join and bond. Blows from the smith send the flux flying from the iron like an incandescent firecracker as the weld around the eye takes hold.

An axhead starts as a long piece of iron. The smith gradually shapes and folds it together, like butterfly wings.

The unwelded bit end of the ax begins to form.

Steel for a super-tough bit

An iron ax head will be tough and strong, yet too soft to hold a cutting edge. So, Guthrie must insert and weld into the ax the tool steel bit made of iron and carbon.

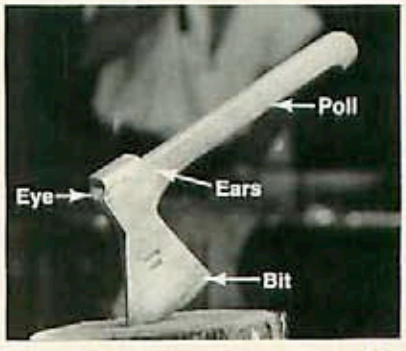
At a special place on the anvil, the smith splits the bit of the ax open, spreads it enough to accept the steel, then "toothes" the iron with a file for for a better bite. After inserting the steel into the head, he puts the ax into the fire and again slowly brings it to welding heat. At white heat he draws it from the forge to the anvil and drives the joint shut, welding and shaping it with heavy blows, working quickly before it cools.

Fixing the temper

By tempering, the blacksmith controlls the bit's hardness. He does this by bringing the cutting end of the axhead to cherry-red heat, then removing it from the fire and plunging it into the water brine of the quench tub. The sudden cooling causes the steel to become a crystalline structure so brittle and hard that a file would skate off it — too brittle to use. He must find the right temper, then fix it. By carefully reheating the ax and its steel bit, Guthrie can modify the molecular structure.

He accomplishes this by using the residual heat still in the unquenched axhead. After once again taking the ax from the forge, Guthrie quenches only the bit end. As soon as the heat glow disappears from the cutting edge, he pulls the metal from the water. Quickly polishing a portion of the edge with sandstone, he watches the bright surface for the changing colors indicating the returning heat's increasing temperature.

First, a yellow color appears that gradually turns brown. When the brown becomes tinged with shades of purple, he quenches it again. Now hard enough to hold a razor edge that will chop dry oak knots, the ax need only be ground to a bright finish. Fitted with a hand-rived handle shaped with a drawknife, it can now begin its work in earnest.



If not for the recent date stamped in the side, this ax could pass for one blacksmiths made 200 years ago.

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YESTERDAY'S TOOLS

THE SHAVE IT TACKLES JOBS THAT PLANES COULDN'T HANDLE

These shaves cost from $20-30 apiece at a flea market. The shave at the top has a rosewood body. The center shave features a rounded cutter. Thumbscrews on the shave at the bottom adjust the cutter.

Popularly named a "spokeshave" because it evolved in the wheelwright's shop where it was used to finish spokes, the shave actually is a very versatile tool. The small shave (usually less than 1' long) combines the functions of the hand plane and the drawknife to remove wood.

Depending on the shape of its blade, called the *cutter,* the shave tackles flat, convex, or concave surfaces, and even chamfers and rabbets. In furniture making, the shave removed the marks made by a drawknife or saw on the scroll of an apron or the curve of a cabriole leg. It might even prepare the surface for the final finish. Because a woodworker could pull or push it, corners were a snap.

Few parts for simple operation

Shaves have a wood or metal body (the latter introduced about 1870) with curving handles, a *throat* like a plane to accept shavings, and a *sole* to ride the workpiece. The removable steel cutter was beveled on only one side of the cutting edge so simple honing kept it sharp. To hold it in place as well as adjust its depth of cut, the cutters on early wood-bodied shaves were forged with two small tangs that fit into the wood. These broke off after years of use, and the craftsman replaced them with set screws. Metal shaves always featured screw adjustments.

Hard work also ruined the soles on wooden shaves. But the owner had only to mortise out the worn sole and insert a flush brass plate for continued service.

Shaves aplenty, at all prices

You can pay $10 to $25 for a brand-new, metal-bodied shave or a reproduction of an old-time wooden one. But these once-common tools still abound at auctions, dealers' shops, and flea markets. A beechwood-bodied shave will cost about $10; plan on $20 to $40 for rosewood, ebony, or boxwood. Unique shapes for specific chores, and metallic ones of brass or bronze may fetch $100.

Photograph: Hopkins Associates

JARRAH:
The Down-Under Paving Wood

Rugged wood, jarrah lasts and lasts, even when used outside as paving and planking material.

Australian craftsmen use jarrah, a eucalyptus that resembles mahogany and teak, for fine furniture, cabinets, and wall paneling. But since the Aussies started exporting jarrah in the 1800s, the rest of the world has found it more suitable for docks, bridges, and decking. In fact, jarrah was used to pave a Hastings, England street in 1897.

Recently, the Down-Under hardwood replaced treated pine in the oceanfront boardwalks of some New Jersey cities — most notably famed Atlantic City. There, 50,000 board feet of jarrah was installed last year as the first step in an extensive renovation.

Jarrah isn't the heaviest wood known, nor the strongest, but it happens to be 15 percent more dense than oak, highly resistant to wear, splintering, dampness, dryrot, and insect attack. And it won't burn unless exposed to a constant flame, an attribute that gives jarrah a Class B fire rating.

As a hardwood, jarrah also can bear a load. A jarrah 1x4 is as strong as a redwood 2x4.

All these qualities make jarrah a construction standout, yet in Australia, it's the size of the trees that prompts the name "king" jarrah. Where jarrah grows in the coastal forests south of Perth, trees reach hearty size — up to 4′ across at the stump, 40′ to the *lowest* branch, and 150′ tall.

Since hardwoods grow so slowly, demand for a species, such as American red oak often threatens it with extinction. Not so in Australia, where the government supervises the only hardwood reforestation program known in the world. Only a small part of the jarrah forest may be harvested annually, thus assuring the future of this remarkable timber.

Photograph: Hopkins Associates
Illustration: Jim Stevenson

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The Bulletin Board

WOODWORKING FACTS, FACES, AND FABLES

ADDING UP YOUR STOCK OPTIONS

Should you make your next project from oak, cherry, walnut, or birch? And what about hardwood plywood versus lumber? Often, these can be tough decisions. But, according to officials of the Fine Hardwoods/American Walnut Association, if you consider only these, you're barely scratching the surface of your options. Actually, they say you have at least 26,100 choices!

First, consider that you can choose from about 300 species of commercially available trees. Each tree provides a minimum of three uniquely different grain patterns — trunk, crotch, and burl. At this point, you have 900 choices, just in solid wood. Now, if we start counting veneers, you can multiply that 900 by four veneering options — rotary-cut, plain-sliced, quarter-sliced, and half-round. That's 3,600 in raw veneer.

You still, however, have your original 900 lumber options. So, together your choices total 4,500 (900 x 4 = 3,600 + 900 = 4,500). But, there's more.

While you probably haven't seen them all, veneers can be laid up seven ways, each with a different look: book match, slip match, random match, vertical butt match, horizontal bookleaf, herringbone, and sunburst. For veneers alone, that brings your options up to 25,200. Add in the 900 lumber offerings, and your choices total 26,100!

In what other hobby can you find such variety?

Illustration: C. L. Gatzke

NEW, EASY-TO-USE INDEX FOR DO-IT-YOURSELF ANSWERS

Wondering about wood fillers? Or concerned with a crackling finish? Your library has the answer on file in back issues of do-it-yourself type magazines and periodicals. But now you won't have to spend hours flipping pages for the right article. Ask the librarian for *The Home Index*, a new annual reference book for the home handyman.

Editors Cameron and Sue Nickels have searched publications for articles on home building, remodeling and repair, do-it-yourself projects of all kinds, hobbies and crafts, and related how-to tools, products, and materials. The result: a quick and easy index to over 3,000 handyman topics printed in 1986. *The 1986 Home Index*, published by RE Publications, of Harrisonburg, Virginia, tells you, by subject, what magazine and issue to find it in, the page numbers, and briefly, what's covered.

COUNT ON A CORD

One cord of wood equals a pile measuring 4x4x8', and most people count on it to produce BTU's. But a cord can do so much more!

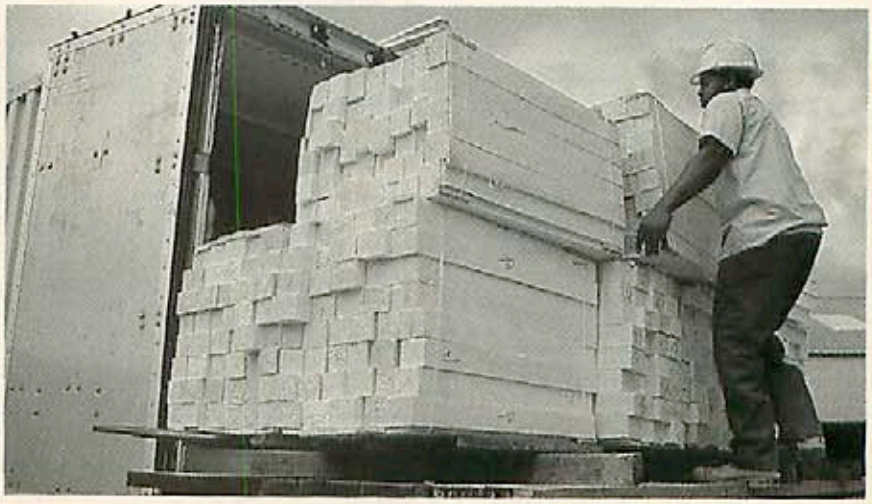
Less the air space in the stack, a cord represents 80 cubic feet of solid wood. That's approximately 500 board feet. According to *The American Tree Farmer*, some of the things that could be made from that amount of wood include:

- 7½ million toothpicks, or,
- 460,000 personal checks, or,
- 250 copies of the *Sunday New York Times*, or,
- 1,200 copies of the *National Geographic*, or,
- 30 Boston rockers, or,
- 12 large dining room tables.

Wood by-products also become a vast range of products, such as vitamins, explosives, photographic film, toothpaste, and pharmaceuticals.

HEY, WHERE'S THE FORKLIFT?

In the port of New Orleans, we spotted this worker loading wood by the armful. He wasn't even sweating. Can you guess what the wood is?

Balsa! Made up of 92 percent dead air space, it weighs less than 10 pounds per cubic foot. This load arrived from South America.

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